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1981

THE COUNTRY'S HIGHEST PARTY FORUM

MAN IN OUTER SPACE

THE BATTLE OF KULIKOVO

CRADLE OF ATOMIC POWER ENGINEERING

RUSSIA'S MAIN CATHEDRAL

LAKE BAIKAL'S LIVING WATER

MOON ROCK

SINGING STAR

YEARBOOK USSR

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81

YEARBOOK USSR

In 1980
—the USSR completed its Tenth Five-Year Plan.
—on board the *Salyut-6* orbital station spacemen from Hungary, Cuba and Vietnam shook hands with Soviet cosmonauts who had been circling the Earth for 185 days.
—Moscow hosted the 22nd Olympic Games.
In 1981
—the Communist Party of the Soviet Union held its 26th Congress

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THE COUNTRY'S HIGHEST PARTY FORUM

The 26th Congress of the Communist Party of the Soviet Union was held in the Kremlin Palace of Congresses in Moscow from February 23 to March 3. The CPSU Central Committee Report was delivered by Leonid Brezhnev, General Secretary of the CPSU Central Committee. Chairman of the USSR Council of Ministers Nikolai Tikhonov reported on the "Guidelines for the Economic and Social Development of the USSR for 1981-1985 and for the Period Ending in 1990".

REPORT OF THE CENTRAL COMMITTEE OF THE CPSU TO THE 26TH CONGRESS OF THE COMMUNIST PARTY OF THE SOVIET UNION AND THE IMMEDIATE TASKS OF THE PARTY IN HOME AND FOREIGN POLICY

Delivered by L. I. Brezhnev,
General Secretary
of the CPSU Central Committee

*February 23, 1981**

The statutory Twenty-Sixth Congress of our Party has begun. It is called upon, as usual, to sum up the results and to determine tasks for the future.

Appraising the traversed path, we can say with assurance that the 25th Congress correctly defined the basic trends and lines of social development. The

*This is an abridged version of the speech.

Party's Leninist general line is being steadily put into effect; the tasks set at the previous congress have, on the whole, been successfully fulfilled.

The Tenth Five-Year Plan period saw a considerable increase in the country's national wealth. Its productive, scientific and technical potential has grown. The defence capability of the Soviet state has become greater. The well-being and the cultural level of the Soviet people have risen.

The family of Soviet peoples has become still more closely united, its bonds of friendship are still stronger.

The adoption of the new Constitution of the USSR was a major event. It ushered in a higher stage in the development of socialist democracy. Soviet people participate more and more actively in running the affairs of society and state.

The indissoluble unity of the Party and the people has grown still stronger in the past five years. As before, it is the source of our society's gigantic strength.

On the international plane, the period under review has been rough and complicated. It has been marked above all by an intensive struggle of two lines in world affairs: the line of bridling the arms race, strengthening peace and detente, and defending the sovereign rights and freedom of nations, on the one hand, and, on the other, the line of disrupting detente, escalating the arms race, of threats and interference in other countries' affairs, and of suppressing the liberation struggle.

These years have seen a further growth of the power, activity and prestige of the Soviet Union and the other countries of the socialist community.

The revolutionary struggle of the peoples has seen new victories. Among these are the revolutions in Ethiopia, Afghanistan, and Nicaragua, and the overthrow of the anti-popular monarchic regime in Iran. In effect, the seventies witnessed the final collapse of the colonial empires.

The sphere of imperialist domination has narrowed. The internal contradictions in capitalist countries and the rivalry between them have grown more acute. The aggressiveness of imperialist policy, notably that of US imperialism, has sharply increased.

If you ask any Soviet person—whether a member of the Communist Party or not—what has highlighted our Party's path in recent years, the answer will be: it was highlighted above all by the fact that we are managing to preserve peace. And for this people of different age and occupation thank the Party from the bottom of their hearts.

It is absolutely obvious that today the Soviet Union and its allies are more than ever the chief buttress of world peace.

I. THE INTERNATIONAL POLICY OF THE CPSU

All these years the Party, its Central Committee and Political Bureau have devoted unremitting attention to strengthening friendship and cooperation with the other socialist countries.

Hand in hand with them we are building a new, socialist world, and a type of truly just, equal, and fraternal relations between states never seen in history before.

This, indeed, is the spirit in which our relations are shaping with the other countries of the socialist community—Bulgaria, Hungary, Vietnam, the

Leonid Brezhnev, General Secretary of the CPSU Central Committee, addresses the 26th Party Congress

German Democratic Republic, Cuba, Laos, Mongolia, Poland, Romania, and Czechoslovakia.

A fundamental unity of views has taken root among us on all major aspects of social and economic development, and international affairs.

The fact that deep mutual understanding, trust, and accord exist between the leaderships of our parties is of great significance.

There have been thirty-seven friendly meetings at summit level in the Crimea during these years. There was a systematic exchange of party and government delegations. Conferences of Central Committee secretaries on questions of international relations, and ideological and organisational Party work have become a regular fixture.

The Party organisations of the Soviet Union and those of the other countries of the socialist community are linked by many threads.

The range of our cooperation extends to more and more spheres. One example is the Intercosmos programme.

The constitutions of most fraternal countries emphasise the ideas of friendship and cooperation with the Soviet Union. This is a token of deep confidence in our country, and we reciprocate in kind. The new Constitution of the USSR declares friendship, cooperation, and mutual assistance with other socialist countries the cornerstone of Soviet foreign policy.

The period under review has convincingly shown the highly influential and beneficial effect of the activity of the Warsaw Treaty Organisation, notably its Political Consultative Committee, on European affairs and, for that matter, on world affairs as a whole.

The Central Committee reports to the Congress that the defensive political and military alliance of the socialist countries is faithfully serving the cause of peace. It has all the requisites reliably to defend the socialist gains of our peoples. And we will do everything for this to be so in the future.

Far be it from us, comrades, to paint the picture of the present-day socialist world in exclusively radiant colours. Complications, too, occur in the development of our countries. The passage to intensive economic development and large-scale social programmes, and the moulding of the communist consciousness—all this cannot be achieved overnight. It takes time and tireless creative search. And, of course, it is essential to learn from each other.

At our past congress, we, like the other fraternal parties, set the task of further extending socialist integration on the basis of long-term special-purpose programmes as a top priority. These programmes are to help us resolve the most acute, vitally important economic problems.

Life is setting us the task of supplementing coordination of our plans with coordination of economic policy as a whole. There are many new major problems. Perhaps it would be useful for the leaders of the fraternal countries to discuss them collectively in the near future.

The problems that arise in the process of our cooperation are being solved jointly, and we jointly seek the most correct ways of harmonising the interests of each fraternal country with the common interest.

There are special cases, too, when friends need urgent aid. This was the case with Vietnam, which became the target of a barbarian aggression by Peking in 1979. The Soviet Union and other countries of the socialist community promptly sent it shipments of food, medical supplies, building materials, and arms. This was also the case with Kampuchea, which had been devastated by the Pol Pot clique of Peking henchmen.

That, comrades, is socialist internationalism in action. Soviet people understand and approve of such a stand.

The imperialists and their accomplices are systematically conducting hostile campaigns against the socialist countries. Recent events have shown again and again that our class opponents are learning from their defeats. Their actions against the socialist countries are increasingly refined and treacherous.

And wherever in addition to imperialist subversive activity there are mistakes and miscalculations in home policy, there arise conditions that stimulate elements hostile to socialism. This is what has happened in fraternal Poland, where opponents of socialism supported by outside forces are, by stirring up anarchy, seeking to channel events into a counter-revolutionary course. As was noted at the latest plenary meeting of the Polish United Workers' Party Central Committee, the pillars of the socialist state in Poland are in jeopardy.

At present, the Polish comrades are engaged in redressing the critical situation. They are striving to enhance the Party's capacity for action and to tighten links with the working class and other working people, and are preparing a concrete programme to restore a sound Polish economy.

Last December's meeting of leaders of the Warsaw Treaty countries in Moscow has rendered Poland important political support. It showed clearly that the Polish Communists, the Polish working class, and the working people of that country can firmly rely on their friends and allies; we will not abandon fraternal, socialist Poland in its hour of need, we will stand by it.

The events in Poland show once again how important it is for the Party, for the strengthening of its leading role, to pay close heed to the voice of the masses, resolutely to combat all signs of bureaucracy and voluntarism, actively to develop socialist democracy, and to conduct a well-considered and realistic policy in foreign economic relations.

The history of world socialism has seen all sorts of trials. There were difficult times and critical situations. But Communists have always courageously faced the attacks of the adversary, and have invariably won. That's how it was, and that's how it will be. And let no one doubt our common determination to secure our interests and to defend the socialist gains of the peoples.

Our relations with the socialist countries that are not in the Warsaw Treaty or CMEA are also developing.

Soviet-Yugoslav cooperation is going ahead in many fields. Soviet-Yugoslav friendship has deep roots, and we have no doubts about its future.

The Soviet Union supports the Democratic People's Republic of Korea in its struggle for the country's peaceful democratic unification without outside interference, and strives to extend and enrich ties with it.

Special mention must be made of China. The experience of the social and economic development of the PRC over the past twenty years is a painful lesson showing what any distortion of the principles and essence of socialism in home and foreign policy leads to.

The present Chinese leaders themselves describe what happened in the period of the so-called cultural revolution in their country as "a most cruel feudal-fascist dictatorship". We have nothing to add to this assessment.

At present, changes are under way in China's internal policy. Time will show what they actually mean. It will show to what extent the present Chinese leadership will manage to overcome the Maoist legacy. But, unfortunately, there are no grounds yet to speak of any changes for the better in Peking's foreign policy. As before, it is aimed at aggravating the international situation, and is aligned with the policy of the imperialist powers. That, of course, will not bring China back to the sound road of development. Imperialists will never be friends of socialism.

The simple reason behind the readiness of the United States, Japan, and a number of NATO countries to expand their military and political ties with China is to use its hostility to the Soviet Union and the socialist community in their own, imperialist interests. That is a hazardous game.

If Soviet-Chinese relations are still frozen, the reason for this has nothing to do with our position. The Soviet Union has never sought, nor does it now seek any confrontation with the People's Republic of China. We follow the course set by the 24th and 25th Congresses of the CPSU, and would like to build our ties with that country on a good-neighbour basis. Our proposals for normalising relations with China remain open, and our feelings of friendship and respect for the Chinese people have not changed.

As you see, on the whole the Central Committee has been doing a tremendous amount of work in order to develop and deepen our relations with the socialist countries. In economic and cultural development, and in improving social relations and socialist democracy—in literally all fields—world socialism is advancing steadily. *And we Soviet Communists are proud of the role played in this by the Party of Lenin, by the country of the Great October Revolution.*

Among the important results of the Party's international activity in the period under review we can list the visible expansion of cooperation with countries that have liberated themselves from colonial oppression.

Let me first deal with the socialist-oriented states, that is, states that have opted for socialist development. Their number has increased.

In the period under review, the Soviet Union has concluded treaties of friendship and cooperation with Angola, Ethiopia, Mozambique, Afghanistan, and the People's Democratic Republic of Yemen. Recently, a treaty of friendship and cooperation was signed with Syria. I am sure that it will serve well to further the Soviet-Syrian friendship and the achievement of a just peace in the Middle East.

We are developing wide-ranging mutually beneficial economic, scientific, and technical cooperation with the newly-free countries.

Together with the other socialist countries, we are also helping to strengthen the defence capability of newly-free states if they request such aid. This was the case with, say, Angola and Ethiopia. Attempts were made to crush the people's revolutions in these countries by encouraging domestic counter-revolution or by outside aggression. We are against the export of revolution, and we cannot agree to any export of counter-revolution either.

Imperialism launched a real undeclared war against the Afghan revolution. This also created a direct threat to the security of our southern frontier. In the circumstances, we were compelled to render the military aid asked for by that friendly country.

The plans of Afghanistan's enemies have collapsed. The well-considered policy of the People's Democratic Party and the government of Afghanistan headed by Comrade Babrak Karmal, which is in keeping with the national interests, has strengthened the people's power.

As for the Soviet military contingent, we will be prepared to withdraw it with the agreement of the Afghan government. Before this is done, the infiltration of counter-revolutionary gangs into Afghanistan must be completely stopped. This must be secured in accords between Afghanistan and its neighbours. Dependable guarantees are required that there will be no new intervention. Such is the fundamental position of the Soviet Union, and we adhere to it firmly.

The revolution in Iran, which was a major event on the international scene in recent years, is of a specific nature. However complex and contradictory, it is

essentially an anti-imperialist revolution, though reaction at home and abroad is seeking to change this feature.

The people of Iran are looking for their own road to freedom and prosperity. We sincerely wish them success in this, and are prepared to develop good relations with Iran on the principles of equality and, of course, reciprocity.

A prominent place in the Soviet Union's relations with the newly-free countries is, of course, held by our cooperation with India. We welcome the increasing role played by that state in international affairs. Our ties with it are continuing to expand. In both our countries, Soviet-Indian friendship has become a deep-rooted popular tradition.

As a result of the recent negotiations in Delhi with Prime Minister Indira Gandhi and other Indian leaders, the entire range of Soviet-Indian relations has advanced substantially further.

Joint action with peaceful and independent India will continue to be one of the important areas of Soviet foreign policy.

The imperialists are displeased with the fact that the newly-free countries are consolidating their independence. In a thousand ways they are trying to bind these countries to themselves in order to deal more freely with their natural riches, and to use their territory for their strategic designs. In so doing, they make extensive use of the old colonialist method of divide and rule.

Indeed, that is also the Western approach to the Irano-Iraqi war, which has been going on for five months. The Soviet Union resolutely calls for an early end to that fratricidal war, and a political settlement of the conflict. In practice, too, we are striving to facilitate this.

Now about the Middle East problem. In its bid for dominance in the Middle East, the United States has taken the path of the Camp David policy, dividing the Arab world and organising a separate deal between Israel and Egypt. US diplomacy has failed to turn this separate anti-Arab deal into a broader agreement of a capitulationist type. But it has succeeded in another way: a new deterioration of the situation has occurred in the region. A Middle East settlement was cast back.

What now? As we see it, it is high time to get matters off the ground. It is time to go back to honest collective search of an all-embracing just and realistic settlement. In the circumstances, this could be done, say, in the framework of a specially convened international conference.

The Soviet Union is prepared to participate in such work in a constructive spirit and with good will.

The non-aligned movement has been and remains an important factor in international relations. Its strength stems from the stand it takes against imperialism and colonialism, and against war and aggression. We are convinced that the key to any further heightening of its role in world politics—and this we would welcome—is its dedication to these basic principles.

No one should have any doubts, comrades, that *the CPSU will consistently continue the policy of promoting cooperation between the USSR and the newly-free countries, and consolidating the alliance of world socialism and the national liberation movement.*

The international working class and its political vanguard—the Communist and Workers' parties—approached the eighties with confidence. They approached them as active fighters for the rights of the working people, and for peace and the security of nations.

Today, Communist parties are active in 94 countries. In Western Europe alone, some 800,000 new fighters have joined their ranks in the past ten years.

Having cited examples of the active work of the CPSU and its Central Committee for the further expansion and deepening of all-round cooperation with the fraternal parties, the speaker pointed out:

As the influence of the Communist parties grows, the tasks facing them are becoming more and more complex and diverse. And sometimes that gives rise to divergent appraisals and differences in approach to concrete issues of the class struggle, and to discussions between parties.

The supreme arbiter in resolving problems is time and practice. Lenin was absolutely right when he said that many differences "can, and unfailingly will, vanish; this will result from the logic of the joint struggle against the really formidable enemy, the bourgeoisie..."

Some time ago the leaderships of a few Communist parties began to vigorously defend the right to specifically national ways and forms of struggle for socialism and of building socialism. But if you look at this without prejudice, you will see that no one is imposing any stereotypes or patterns that ignore the distinctions of any country.

Lenin's attitude on this score is well known. "All nations," he wrote, "will arrive at socialism—this is inevitable, but all will do so in not exactly the same way, each will contribute something of its own to some form of democracy, to some variety of the dictatorship of the proletariat, to the varying rate of socialist transformations in the different aspects of social life."

Our Party has never departed from Lenin's principle, which has by now been thoroughly corroborated by the facts of history.

The establishment and consolidation of socialist foundations and the building of socialist society, as I have already said, also had and still have distinctive features in different countries.

So, as I see it, unless one ignores the actual facts, one cannot speak of any "uniformity" or contrast Communist parties according to the criterion of recognising or not recognising the ways they choose to reconstruct society.

As our Party sees it, differences of opinion between Communists can be overcome, unless, of course, they are fundamental differences between revolutionaries and reformists, between creative Marxism and dogmatic sectarianism or ultra-Left adventurism. In that case, of course, there can be no compromises—today just as in Lenin's lifetime.

The great unifying principle, a powerful factor furthering cohesion and enhancing the prestige of the world communist movement, is the Communists' unremitting struggle for peace, against imperialism's aggressive policy, and the arms race that carries with it the danger of a nuclear disaster.

We have good friendly relations with the vast majority of Communist parties—the French, Portuguese, German, Greek, Finnish, Danish, Austrian, and other Communist parties of Europe. The CPSU has the same good relations with fraternal parties in the countries of America, Asia, and Africa, and in Australia. And we will continue to strengthen these relations in the name of our common cause—the cause of peace and socialism.

The report which pointed out the consolidation of the cooperation between the CPSU and other democratic forces stressed that in the conditions of the present complication of the international situation we attach importance to cooperation with Social Democrats, trade unions, religious circles, and all democratic and peace-loving forces in the matter of preventing war and strengthening peace.

We express our deep-felt solidarity with our Communist brothers languishing in the dungeons of fascist dictatorships, with those persecuted by the police or fighting their hard battles underground. We express our solidarity with those

subjected to discrimination and deprived of civil and political rights merely for their convictions, for belonging to the party of the working class.

Honour and glory to Communists, courageous fighters for the people's cause!

In the period under review the USSR continued to pursue Lenin's policy of peaceful coexistence and mutually beneficial cooperation with capitalist states, while firmly repulsing the aggressive designs of imperialism.

A further aggravation of the general crisis of capitalism was witnessed during these years. To be sure, capitalism has not stopped developing. But it is immersed in what is already the third economic recession in the past ten years.

The report points out that inflation in the capitalist countries has acquired an unprecedented scope, social contradictions have grown visibly more acute, inter-imperialist contradictions are becoming sharper, and the scramble for markets and for sources of raw materials and energy is more frantic.

Adventurism and a readiness to gamble with the vital interests of humanity for narrow and selfish ends—this is what has emerged in a particularly barefaced form in the policy of the more aggressive imperialist circles, said L. I. Brezhnev. With utter contempt for the rights and aspirations of nations, they are trying to portray the liberation struggle of the masses as "terrorism". Indeed, they have set out to achieve the unachievable—to set up a barrier to progressive changes in the world, and to again become the rulers of the peoples' destiny.

Military expenditures are rising unprecedentedly.

They want people to believe that nuclear war can be limited, they want to reconcile them with the idea that such war is permissible.

Imperialist circles think in terms of domination and compulsion in relation to other states and peoples.

The monopolies need the oil, uranium and non-ferrous metals of other countries, and so the Middle East, Africa and the Indian Ocean are proclaimed spheres of US "vital interests". The US military machine is actively thrusting into these regions, and intends to entrench itself there for a long time to come. Diego Garcia in the Indian Ocean, Oman, Kenya, Somalia, Egypt—where next?

To justify this, Washington is spreading the story of a "Soviet threat" to the oil wealth of the Middle East or the oil supply lines. That is a deliberate falsehood, because its authors know perfectly well that the Soviet Union has no intention of impinging on either the one or the other. And in general, it is absurd to think that the oil interests of the West can be "defended" by turning that region into a powder keg.

In our relations with the United States during all these years we have, as before, followed a principled and constructive line. It is only to be regretted that the former administration in Washington put its stakes on something other than developing relations or on mutual understanding. Trying to exert pressure on us, it set to destroying the positive achievements that had been made with no small effort in Soviet-American relations over the preceding years. As a result, our bilateral ties suffered a setback in a number of fields. The entry into force of the SALT-2 treaty was deferred.

Unfortunately, also since the change of leadership in the White House openly bellicose calls and statements have resounded from Washington, as if specially designed to poison the atmosphere of relations between our countries. We would like to hope, however, that those who shape United States policy today will ultimately manage to see things in a more realistic light. The military and strategic equilibrium prevailing between the USSR and the USA, between the Warsaw Treaty and NATO, objectively serves to safeguard world peace. We have not sought, and do not now seek, military superiority over the other side. That is not our policy. But neither will we permit the building up of any such

superiority over us. Attempts of that kind and talking to us from a position of strength are absolutely futile.

It is universally recognised that in many ways the international situation depends on the policy of both the USSR and the USA. As we see it, the state of relations between them at present and the acuteness of the international problems requiring a solution necessitate a dialogue, and an active dialogue, at all levels. We are prepared to have such a dialogue.

Experience shows that the crucial factor here is meetings at summit level. This was true yesterday, and is still true today.

The USSR wants normal relations with the USA. There is simply no other sensible way from the point of view of the interests of our two nations, and of humanity as a whole.

For our Party and the Soviet state the past five years have been years of purposeful struggle for European peace and security.

Despite the efforts of enemies of detente, peaceful cooperation between countries of the two systems is, by and large, making good headway on the European continent.

An extensive system of ties has taken shape between the Soviet Union and France. A practically uninterrupted political dialogue is being maintained at various levels, first of all with President Valery Giscard d'Estaing. Soviet-French trade has tripled.

Our relations with the Federal Republic of Germany, based on the 1970 treaty and later agreements, have on the whole developed favourably.

The report also gives an appraisal of the relations between the Soviet Union and Italy, Finland, Turkey, Greece, Austria, Sweden, Belgium, Cyprus, Spain and Britain.

Speaking of European affairs, we must not ignore the new and serious dangers that have arisen to European peace. This refers first of all to the NATO decision of deploying new US nuclear missiles in Western Europe. This decision is no "response" to any imagined Soviet challenge. Neither is it an ordinary "modernisation" of the arsenal, as the West would have us believe. It speaks of an obvious intention to tilt the existing military balance in Europe in NATO's favour.

It must be clearly understood: the deployment in the FRG, Italy, Britain, the Netherlands or Belgium of new US missiles, targeted against the USSR and its allies, is bound to affect our relations with these countries, to say nothing of how this will prejudice their own security.

The vital interests of the European nations require that Europe should follow a different path—the path blazed in Helsinki.

About our relations with Japan. Gaining prominence in its foreign policy are negative elements—playing up to the dangerous plans of Washington and Peking, and the trend towards militarisation. We do not think, however, that this is, so to speak, Tokyo's last word. As before, the Soviet Union is in favour of lasting and truly good-neighbourly relations with Japan.

We are pleased to note the expansion of the Soviet Union's mutually beneficial ties with countries of Latin America and are prepared to continue expanding them.

There are also good potentialities for developing our relations with Canada.

Life requires fruitful cooperation of all countries for solving the peaceful, constructive problems facing every nation and all humanity.

The central direction in the foreign policy of our Party and Government is, as it has always been, to lessen the danger of war and to curb the arms race. At

the present time this objective has become one of special importance and urgency.

There is probably no other country that has in recent years put forward before the world such a wide spectrum of concrete and realistic initiatives on the most crucial problems of international relations, as the Soviet Union has done.

Among such initiatives the report mentions the proposals on the limitation of nuclear armaments, on the prohibition of all other types of mass destruction weapons, on military detente in Europe, on the reduction of armed forces and armaments in Central Europe, and so on.

The Soviet proposals for consolidating international security and limiting the arms race remain in force. Soviet diplomats and all other officials in the foreign relations sector are continuing, under the guidance of the Party's Central Committee, to press for their implementation.

Our actions are consonant with the aspirations of other countries and peoples.

We are carrying on the fight for a radical improvement of the international situation. The trustworthy compass here is, as it has been, the Peace Programme of the 24th and 25th Congresses of the CPSU.

Today the state of world affairs requires new, additional efforts to remove the threat of war, and buttress international security. Permit me to put before the Congress a number of ideas directed to this end.

In recent years, as you know, flash points of military conflict, often threatening to grow into a major conflagration, have flared up now in one and now in another region of the world. Experience has shown that it is not easy to extinguish them. It would be far better to take preventive measures, to forestall their emergence.

In Europe, for example, this purpose is to some extent served—and fairly well on the whole—by the confidence-building measures carried out in the military field by decision of the European Conference. They include advance notification of military exercises of ground troops, and invitation to them of observers from other countries. At present, these measures apply to the territory of the European states, including the Western regions of the USSR. We have already said that we are prepared to go further and to give notice of naval and air exercises. We have proposed—and propose again—that there should also be advance notification of large-scale troop movements.

And now we want to propose that the zone for these measures should be substantially extended. *We are prepared to apply them to the entire European part of the USSR, provided the Western states, too, extend the confidence zone accordingly.*

There is a region where elaboration and use of confidence-building measures—naturally, with due consideration for its specific features—could not only defuse the situation locally, but also make a very useful contribution to strengthening the foundations of universal peace. That region is the Far East, where such powers as the Soviet Union, China, and Japan border on each other. There are also US military bases there. *The Soviet Union would be prepared to hold concrete negotiations on confidence-building measures in the Far East with all interested countries.*

We make these far-reaching proposals for confidence building in the belief that their implementation will facilitate progress in the field of disarmament.

Further. It is sometimes said about our Persian Gulf proposals that they should not be divorced from the question of the Soviet military contingent in Afghanistan. What could be said on this score? The Soviet Union is prepared to discuss the Persian Gulf as an independent problem. It is also prepared, of

course, as I have already said, to participate in a separate settlement of the situation around Afghanistan. *But we do not object to the questions connected with Afghanistan being discussed together with the questions of Persian Gulf security*. Naturally, this applies only to the international aspects of the Afghan problem, and not to internal Afghan affairs. Afghanistan's sovereignty, like its non-aligned status, must be fully protected.

Once again, we insistently call for restraint in the field of strategic armaments. It should not be tolerated that the nations of the world live in the shadow of a nuclear war threat.

Limitation and reduction of strategic armaments is a paramount problem. *For our part, we are prepared to continue the relevant negotiations with the United States without delay, preserving all the positive elements that have so far been achieved in this area*. It goes without saying that the negotiations can be conducted only on the basis of equality and equal security. We will not consent to any agreement that gives a unilateral advantage to the USA. There must be no illusions on this score. In our opinion, all the other nuclear powers should join these negotiations at the appropriate time.

The USSR is prepared to negotiate limitation of weapons of all types. At one time we offered to ban the development of the naval Trident missile system in the United States and of a corresponding system in our country. The proposal was not accepted. As a result, the United States has built the new Ohio submarine armed with Trident-1 missiles, while an analogous system, the Typhoon, was built in our country. So, who has stood to gain?

We are prepared to come to terms on limiting the deployment of the new submarines—the Ohio type by the USA, and similar ones by the USSR. We could also agree to banning modernisation of existing and development of new ballistic missiles for these submarines.

Now about the nuclear-missile weapons in Europe. An ever more dangerous stockpiling of them is in train. A kind of vicious circle has appeared, with the actions of one side precipitating counter-measures by the other. How to break this chain?

We suggest coming to terms that already now a moratorium should be set on the deployment in Europe of new medium-range nuclear-missile weapons of the NATO countries and the Soviet Union, that is, to freeze the existing quantitative and qualitative level of these weapons, naturally including the US forward-based nuclear weapons in this region. The moratorium could enter into force at once, the moment negotiations begin on this score, and could remain in force until a permanent treaty is concluded on limiting or, still better, reducing such nuclear weapons in Europe. In making this proposal, we expect the two sides to stop all preparations for the deployment of respective additional weapons, including US Pershing-2 missiles and land-based strategic cruise missiles.

The peoples must know the truth about the destructive consequences which a nuclear war could have for mankind. *We suggest that a competent international committee should be set up, which would demonstrate the vital necessity of preventing a nuclear catastrophe*. The committee could be composed of the most eminent scientists of different countries. The whole world should be informed of the conclusions they draw.

It seems to us that it would be *useful to call a special session of the Security Council with the participation of the top leaders of its member-states in order to look for keys to improving the international situation, and preventing war. If they so wish, leaders of other states could evidently also take part in the session.* Certainly, thorough preparations would be needed for such a session to achieve positive results.

All these proposals pursue a single aim, our one common aspiration—to do everything possible to relieve the peoples of the danger of a nuclear war, to preserve world peace.

This, if you like, is an organic continuation and development of our Peace Programme in reference to the most burning, topical problems of present-day international life.

To safeguard peace—no task is more important now on the international plane for our Party, for our people and, for that matter, for all the peoples of the world.

Not war preparations that doom the peoples to a senseless squandering of their material and spiritual wealth, but consolidation of peace—that is the clue to the future.

II. THE ECONOMIC POLICY OF THE CPSU IN THE PERIOD OF DEVELOPED SOCIALISM

Then the speaker turned to matters concerning the economic policy of the CPSU. Guiding the national economy, he said, constitutes the core of all Party and government activity. For it is in the economic field that the foundation is being laid for accomplishing social tasks and strengthening the country's defence potential, the foundation for a vigorous foreign policy. It is here that the necessary prerequisites are being created for the successful advance of Soviet society to communism.

On the threshold of the seventies, the Party carried out a comprehensive analysis of the state of the national economy and defined the principal ways of solving the socio-economic problems of developed socialism. The Party approach, the political approach to the economy has invariably been based on the programmatic requirement—everything for the sake of man, for the benefit of man.

The report includes the basic indices of the economic and social development of the USSR in the 1970s.

The national economy balance sheet furnishes convincing proof that the Party's economic strategy is correct, L. I. Brezhnev went on to say. The country has made substantial progress in all the areas of building the material and technical basis of communism. The productive forces of Soviet society have attained a qualitatively new level.

Soviet men and women have worked hard, in "shock-work" style. Rallied closely around Lenin's Party and treating its master plans as a matter of vital concern to them personally, the working people in town and country have spared no efforts in building up the country's economic potential. Honour and glory to Soviet men and women—to the working people! They are the main, invaluable asset of our society.

Throughout the past decade there were persistent efforts to enhance the efficiency of the national economy. The most meaningful indicator here is the productivity of labour. It rose during this period by nearly 50 per cent.

Characteristic of the seventies were big changes in the location of productive forces. In pursuance of decisions of the 25th Congress of the CPSU, territorial-industrial complexes are being formed in the European part of the

Russian Federation, in the Urals, Siberia, the Far East, Kazakhstan and Tajikistan.

All this is a result of the Party's far-sighted policy. All this is a result of the fortitude and enthusiasm of the workers, engineers, technicians, and scientists who—working in difficult, at times incredibly difficult conditions—have put extremely rich natural resources at the service of the national economy. What they have accomplished is a real exploit, an exploit for the sake of the people and for the good of the people.

The seventies were a period of steady growth for heavy industry. The output of the means of production increased as much as in the previous 20 years. Electric power generation doubled compared with the sixties. The country's metallurgy has been further reinforced. A vast development programme has been carried out in the engineering industry. There have been appreciable quantitative and qualitative changes in the chemical and petrochemical industries.

The past two five-year plans notably strengthened the technical base of agricultural production. Capital investments in the agrarian sector of the economy have been increased. In ten years they exceeded 300.000 million roubles. This is 2.3 times as much as in the previous decade.

The total agricultural production in the Ninth and Tenth Five-Year Plan periods was 272,000 million roubles greater than in the previous two five-year plan periods.

The report provides information on the implementation in the 1970s of a wide-scale programme of improving the people's well-being.

More housing was built in the seventies than the entire stock of urban housing that existed at the beginning of the sixties. The scale of housing construction is, comrades, a great social achievement of ours.

In sum, the main objective of the Party's economic strategy is being consistently implemented. Complex though the problems arising here are, the course charted by the Party is steadily being put into effect.

On the whole, the seventies may be summed up as a major step in developing the national economy of the country, of all the Union and autonomous republics.

The socio-political meaning of these results is seen by the CPSU Central Committee in that steady economic progress served as a basis for the continued improvement of the entire system of social relations, of our socialist way of life. What has been accomplished is the result of the dedicated work of tens of millions of people, of the vigorous activities of Party organisations, the Soviets of People's Deputies, the trade unions and the Young Communist League, and of the scale of the socialist emulation movement. Today, as we look back on the past years, we have every reason to say that a gigantic job has been accomplished. Our great country has become stronger, richer, and more beautiful.

While paying tribute to the Soviet people's truly historic achievements, the CPSU Central Committee at the same time clearly discerns the difficulties, the shortcomings, and the unsolved problems. Not all of the targets set were achieved. Not all of the ministries and enterprises fulfilled their plans. There are still bottlenecks and disproportions in the national economy.

L. I. Brezhnev pointed out that for a still more determined drive to eliminate the obstacles impeding economic growth there is only one way: to be more exacting, to learn to work and to run things more efficiently.

The objectives fixed for the Eleventh Five-Year Plan and the eighties are set forth in detail in the CPSU Central Committee's draft Guidelines for the

Veteran Communist Vasili Vinogradov chatting with Congress delegates

Congress delegates on their way to the Kremlin

Economic and Social Development of the USSR for 1981-1985 and the Period Ending in 1990. Upwards of 121 million people took part in discussing it. The draft received the wholehearted approval and support of the working class, the collective farmers, and the intelligentsia.

Allow me, from the platform of the Congress, to thank all the comrades—Communists and non-Party people alike—who took part in discussing the Guidelines.

The proprietary interest taken by millions of working people in the Party's socio-economic plans and their concern for affairs of the state are an expression of the genuinely democratic nature of the Soviet system. This is an important guarantee of the successful fulfilment of our plans.

The country has entered the new decade with a powerful economic and scientific-technological potential, and with a multi-million army of well-trained and dedicated personnel.

A number of factors that tend to make economic development more complicated will, as you know, operate in the eighties. One of them is a decline in the growth of manpower resources. Another is the growth of expenditures due to developing the East and the North, and also the inevitable increase in spending on environmental protection. To this it must be added that there are quite a few old enterprises in need of cardinal reconstruction.

Built into the draft Guidelines is the continuity of the Party's economic strategy, and they likewise take account of the specific conditions in which our country will be developing. It is from this viewpoint that the aims of economic growth and the principal ways of achieving them have been defined.

"The central objective of the Eleventh Five-Year Plan", it is said in the draft, *"is to ensure the further improvement of the Soviet people's well-being on the basis of the steady and constructive development of the national economy, accelerated scientific and technological progress, the transition of the economy to the road of intensive development, the more rational utilisation of the country's production potential, the maximum saving of all types of resources, and an improvement in the quality of work."*

An express condition for accomplishing all the economic tasks—in production and the social sphere—is the development of heavy industry. This applies in particular to its basic branches and, first and foremost, to *fuel and power*. The speaker stressed that the task of improving the structure of the fuel and power budget is becoming ever more urgent.

The production of gas and oil in West Siberia, and their transportation to the European part of the country, said L. I. Brezhnev, have to be made most important elements of the energy programme in the Eleventh Five-Year Plan and also in the Twelfth. Such is the view of the Party's Central Committee, and, I trust, it will be supported by the Congress.

The new five-year plan provides for big allocations to the development of *metallurgy*, ferrous and non-ferrous. We will, of course, put into operation new metallurgical capacities. But there is also another way of overcoming the shortage of metal—the more competent and fuller utilisation of what is produced.

The new five-year plan will be a serious test for our *builders*. A characteristic feature of the plan is the maximum concentration of efforts on the speedy completion and commissioning of the enterprises that can assure the biggest increase in production and eliminate bottlenecks. We have already taken this course, and it has to be followed unswervingly.

I feel I must dwell specially on the performance of *transport*. In view of the serious character and scale of the problems that had accumulated in transport,

we concluded that they could be solved only on the basis of a long-term comprehensive programme. The framing of such a programme is envisaged in the Guidelines.

This programme will have to provide for optimal patterns of freight traffic and, of course, there is a need for the serious improvement of passenger traffic by cutting timetable disruptions to a minimum, making railway stations and airports more comfortable, and raising the general standard of services.

The CPSU Central Committee calls on all the workers of the power industry, metallurgy, and other branches of the heavy industry, builders, and transport workers to mark the new five-year plan with innovative, shock-style, work for the good of the country.

Every area of the economy faces its current tasks and specific problems. But there are problems that extend to all the spheres of the national economy, and the most important of them is to complete the switchover to primarily intensive development.

The speaker voiced some considerations of principle relevant to our economic policy both in the coming five years and throughout the entire decade that has begun.

Truly enormous resources have been involved in the national economy, he said. It has been noted repeatedly that the Soviet Union has advanced to first place in the world in the output of many important products. We have a greater number of engineers than other countries have. All this, comrades, is cause for pride.

But along with pride there must always be a deep sense of responsibility. Responsibility for having this vast potential, built up by the Soviet people, utilised in the most rational way, with maximum results.

It is within our powers now, comrades, to cope with the biggest and most complex tasks. But economic policy is coming to hinge on a matter that would seem simple and quite routine—a thrifty attitude to social property, and an ability to make full and rational use of everything we have. It is on this that the initiative of work collectives and the Party's mass activities should be concentrated. It is on this that technological policy, investment policy, and the system of planning and accounting indicators should be concentrated.

An economy must be economical—that is dictated by the times.

The conditions in which the national economy will be developing in the eighties make the acceleration of scientific and technological progress ever more pressing. There is no need to persuade anyone of the great importance of science. The Communist Party proceeds from the premise that building up a new society without science is simply inconceivable.

The CPSU Central Committee urges that the role and responsibility of the Academy of Sciences of the USSR be further enhanced, and that the organisation of the entire research system be improved.

A crucial, most vital area today is the application of scientific discoveries and inventions.

The personal responsibility of the heads of government departments, enterprises, and institutes for manufacturing new types of products and introducing new, advanced technologies has to be enhanced. Everything that tends to make the process of introducing novelties difficult, slow, and painful has to be removed.

Another point is the level of requirements with regard to the quality of products. These ought to be the highest requirements, it seems to me. We cannot and must not accept anything less than the highest world and domestic standards.

In short, comrades, the close integration of science and production is an imperative of the contemporary epoch. The CPSU Central Committee is convinced that workers in science and technology, engineers and designers, the heads of industries and production units will do everything to meet this demand.

Today, as we look five or ten years ahead, we must not forget that it is in those years that the economic structure the country will have in the 21st century will be established. It should embody the basic features and ideals of the new society, be in the forefront of progress, and symbolise the integration of science and production, the unbreakable unity of creative thought and creative work.

The Party is putting forward a sweeping programme of further improving the people's well-being in the eleventh five-year plan period and the eighties in general. This programme calls for improving all aspects of the Soviet people's life—consumption and housing, cultural and recreational facilities, working and living conditions.

It is planned to begin so important a measure as raising minimum pay to 80 roubles a month, and other wages and salaries.

Needless to say, improving the standard of living does not boil down to simply increasing money incomes. Today, in the view of the CPSU Central Committee, the task moving to the foreground is that of improving supplies of food and manufactured consumer goods to the population.

Production of foodstuffs has been growing throughout the past few five-year periods. At the same time the Party's Central Committee and the Political Bureau of the CPSU Central Committee, being well aware of the situation in each republic and each region, see that difficulties in supplying the population with food still exist. Steps were and are being taken in this connection along the lines both of internal resources and of foreign trade.

For a radical solution of this problem it has been found necessary to work out a special *food programme*. It should assure a considerable increase in the output of farm produce. It should integrate agriculture more closely with the industries concerned with storing and processing farm produce and, of course, with trade. In other words, its purpose is to solve the problem of assuring uninterrupted food supplies to the population in the shortest possible time. The work on this programme has just begun, and there are all the more reasons therefore to focus attention on the issues involved.

The food programme is based on the *further advancement of agriculture*. The main trends of the work to be accomplished in the agricultural field were outlined in the decisions of the July (1978) Plenary Meeting of the CPSU Central Committee. They retain their validity.

The first objective is to increase the output of those agricultural products whose shortages are causing particularly disturbing interruption in supplies. I refer above all to meat and other animal products.

Under the Eleventh Five-Year Plan it is proposed to increase meat production by more than three million tons to reach 18.2 million tons in 1985. But that is the minimum. The message of the Central Committee of the CPSU to the Party organisations in the republics, territories, and regions, to the district Party organisations, and to all the working people in the villages is this: livestock farming is today the main front in agriculture. It is necessary, comrades, to display the maximum persistence, the maximum enterprise and flexibility, to make use of all reserves and potentialities so as not only to fulfil but to substantially overfulfil the plans drawn up.

The main difficulty is the shortage of feed. Since the need for food grains is being fully satisfied, the emphasis must be on growing forage crops. Their share in the overall grain harvest has to be considerably increased.

Along with grain, it is, of course, necessary to increase the production of coarse and succulent fodder, and of protein additives.

As far as agriculture as a whole is concerned, the main problem facing it is the same as that facing other branches of the national economy—increasing efficiency and improving quality. But the emphasis now—and this is a distinctive feature of the agrarian policy in the eighties—is being shifted to returns on capital investments, to making agriculture more productive, to deepening and improving its links with all branches of the agro-industrial complex.

The report draws attention to the necessity of raising the skill of personnel, utilising scientific recommendations, studying and utilising worldwide and domestic expertise.

Another job on the agenda, the report noted, is that of extending the variety and increasing the output of the most nutritious food products, and of improving their quality. This calls for extending the capacity of the processing industry and providing it with modern, highly-efficient equipment. It is necessary, I feel, to provide for a more appreciable growth of investments in these branches in the five-year plan. I am sure this will meet with the wholehearted approval of the Party and the people.

The success of all plans and all programmes depends on the attitude to the job, on the conscientious work of people engaged in agriculture, and, therefore, on the system of moral and material incentives.

The CPSU Central Committee and the USSR Council of Ministers recently took a comprehensive decision on this matter. It censures the practice of unwarranted interference in the economic activities of the collective and state farms by certain Party and government officials. It is stated quite definitely in the decision that a unified plan of agricultural produce purchases for five years, broken down by the years, should be fixed for the republics, territories, regions, and districts, for the collective and state farms. At the same time a system of incentives is being introduced for farms that will increase their sales of produce to the state above the average annual level of the previous five-year period.

It is very important that the measures listed be consistently put into effect.

The collective and state farms were and continue to be the mainstay of socialist agriculture. But this certainly does not mean that the potentialities of subsidiary individual holdings may be neglected. Individually-owned vegetable and fruit gardens, poultry and cattle are part of our common wealth.

The CPSU Central Committee has deemed it necessary to take a decision on supplementary measures to develop subsidiary individual holdings. It provides for establishing conditions—both material and moral—that would make citizens more interested in subsidiary farming, and above all in raising livestock and poultry.

Maximum support should also be given to farms run by industrial enterprises to supply their personnel.

Prime significance in the Party's efforts to raise the standard of living should be attached to *expanding the production and improving the quality of consumer goods, and extending public services*.

We have achieved successes in this, and they are substantial. But at a Party congress it is important to concentrate on something else. For it is a fact that year after year plans for the production of many consumer goods have remained unfulfilled, especially in textiles, knitwear, leather footwear, furniture, and television sets. And the quality, finish, and assortment are not improved as they ought to be. In all these matters things must be put right without delay.

And, finally, local initiative is tremendously important. It is necessary for

the Soviets of People's Deputies at all levels to take concrete measures to improve the production and sale of manufactured goods, and to extend public services.

Concrete concern for the concrete person, for his needs and requirements is the alpha and omega of the Party's economic policy. I am reminding you of this to re-emphasise a simple but very important point: the production of goods for the population and the expansion of consumer services are a prime Party concern. And that is how they should be treated.

Solving the problems facing us and utilising the potentialities at our disposal depend to a large extent on the standards of guidance of the national economy, the standards of planning and management.

The importance of discipline, the importance of personal responsibility have increased many times over in present-day conditions. This is especially true of the responsibility of the leading economic, government, and Party personnel. The interests of the state as a whole must always come before the interests of individual ministries and enterprises. Powers—and big powers at that—are vested in leaders so that they could make full use of them. But, in so doing, every leader must always remember his lofty responsibility as well—his responsibility to the men and women he has been entrusted with leading, his responsibility to the Party and the people.

The first point I want to speak about is responsibility for state plan fulfilment. The Party has always regarded the plan as law. Let us speak frankly: this axiomatic truth has begun to be forgotten. The practice of downward plan revision has become widespread.

The time has, evidently, come to make requirements stricter both as regards plan fulfilment and the quality of the plans themselves. A plan must, unquestionably, be realistic and balanced. But it must just as unquestionably be fulfilled.

Another pressing task is to overcome the lack of coordination in the activities of various departments.

The problems arising in our life dictate the need to advance theory, the science of economics, and to bring it closer to the requirements of economic practice. What is meant here is the evolution of a style of work that would organically combine efficiency and discipline with bold initiative and enterprise; a practical and businesslike approach with dedication to lofty goals; a critical attitude to schortcomings, with implicit faith in the historical advantages of the path we have chosen.

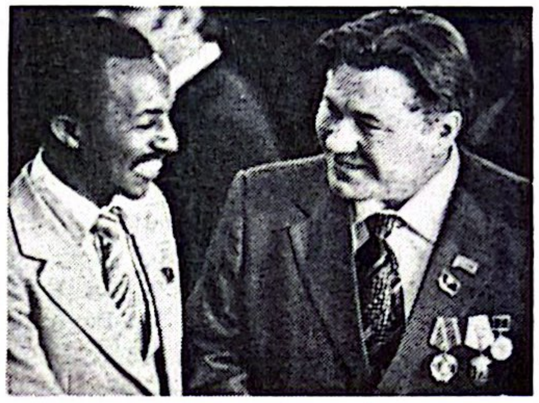
The economic policy the Party is proposing for the Eleventh Five-Year Plan and the eighties reflects the Soviet people's fundamental, vital interests. Combined and merged with the creative initiative and energy of the masses, it assures the steady progress of our society on the road of raising the standard of living and building the material and technical basis of communism.

III. SOVIET SOCIETY'S SOCIO-POLITICAL AND CULTURAL DEVELOPMENT AND THE TASKS OF THE PARTY

The interrelation of economic progress with socio-political and cultural progress grows ever closer under the conditions of mature socialism. With this as its point of departure, the Central Committee of the CPSU has kept questions

Party delegates from the Tajik Union Republic

Terenti Maltsev, an 85-year-old agronomist, talking shop with colleagues



Isidore Hakiziman from Burundi in an interval between Congress sessions

Delegates greet Communist Party and government leaders taking their places on the platform

related to the development of Soviet society's socio-class and national structure and to the improvement of the socialist way of life, our statehood and democracy constantly within the orbit of its attention.

The coming closer together of all the classes and social groups of Soviet society continued in the 1970s.

The *working class* plays an ever larger role in the life of society. It is growing numerically. Today nearly 80 million people, or two-thirds of the employed population, are workers. This means that in our country the working class is not only the largest class numerically but constitutes the majority of the working people. The proportion of workers is steadily growing in Party, trade union, and YCL committees and in higher and local government bodies. This is how it should be, comrades, and we welcome it.

Unquestionably, the consolidation of the leading role played by the working class is linked to the rise of its ideological, political, educational, and professional level.

With the industrialisation of agriculture far-reaching changes are taking place in the life of the *collective-farm peasantry*. Step by step their labour is drawing closer to that of factory workers. The social structure of the countryside is greatly influenced by the drawing together of the two forms of socialist property and by the development of mixed economic organisations involving collective farms and state enterprises.

Of course, we still have many backward farms and many villages that have to be reconstructed, modernised, and provided with new services. In short, much effort, time, and resources are still needed in order to improve the everyday services and cultural facilities in rural communities and overcome the essential differences between town and countryside.

In the period under review our *intelligentsia* has grown the quickest numerically. Today one in every four working persons in our country is linked basically to work by brain.

In evaluating the experience of our society's development over the past few decades, I think we can assume that a classless structure of society will take shape mainly within the historical framework of mature socialism.

The modern working class has been and remains the motive force of this process, its "social intellect and social heart", to quote Marx. Its revolutionary ideology and ethics, its collectivist psychology, and its interests and ideals are now being adopted by all the strata of Soviet society.

Naturally, the erasure of the distinctions between classes sets social policy new tasks. In this context I should like to underscore the need to *even out social distinctions on, so to speak, the territorial plane*. The cultural amenities and everyday life of people differ in the various regions of our huge country. These are the distinctions that, more often than not, complicate the manpower problem in a number of places. More often than not a person leaves Siberia not because the climate is not suitable or the pay is small, but because it is harder to get housing there and to put a child in a kindergarten, and cultural centres are few and far between. That is why in the next five years we plan a faster rate in building housing and the entire socio-cultural complex in these areas and a larger supply of goods for which there is a mass demand.

Acting on the instructions of the 25th Congress, the Central Committee gave serious attention to charting and implementing an effective *demographic policy*, to population problems that have lately grown acute. The principal way to resolve these problems is to show more concern for the family, for newlyweds and, chiefly, for women.

In the period of the Tenth Five-Year Plan steps were taken to improve

working conditions for women, the facilities for family leisure, and everyday and cultural services. However, it must be said bluntly that so far there has been no perceptible change. What is needed is wider and more effective measures. These, as you all know, are charted in the Guidelines.

A few words about yet another group of the population—pensioners. We have lately increased the size of pensions. However, these increases did not extend to persons who had retired earlier. Beginning with the next five years this situation will be corrected gradually.

The fraternal friendship among all the peoples of our multinational country is growing steadily stronger. It is our policy to increase the material and cultural potential of each republic and, at the same time, make the maximum use of this potential for the balanced development of the country as a whole. On this path our achievements have been truly historic.

Ever since Soviet power was established our economic and social policy has been framed in such a way as to bring the outlying regions of old Russia inhabited by national minorities up to the development level of the central regions as quickly as possible. This task has been successfully accomplished. Here a key role was played by close cooperation among all the nations of the country and, chiefly, by the disinterested assistance of the Russian people. Comrades, there are no backward ethnic outskirts today.

The Soviet nations are now more closely united than ever.

The national sensibilities and national dignity of every person are respected in our country. The CPSU has fought and will always resolutely fight against such attitudes alien to the nature of socialism as chauvinism or nationalism, against any nationalistic aberration, be it, say, anti-Semitism or Zionism.

It is the Party's sacrosanct duty to educate the people in a spirit of Soviet patriotism and socialist internationalism, to foster a sense of pride in belonging to the great integral Soviet Union.

Experience shows that the intensive economic and social development of each of our republics speeds up the process of their coming closer together in every field. In our country this process is taking place as it should take place under socialism—on the basis of equality, fraternal cooperation, and free will. The Party makes sure that these Leninist principles of its nationalities policy are observed. We will never depart from them.

Soviet society is a society of *working* people. Now, as before, the Party and the Government are doing much to make the work of people not only more productive but also more meaningful, interesting, and creative. To a great extent this will be fostered by the eradication of manual, unskilled, and arduous physical labour. Millions of people in our country are still engaged in such labour. This is not only an economic but a serious social problem. To resolve it means to remove the substantial barriers to the conversion of labour into the prime vital need of every person.

Socialism gives rise to a new attitude to work. Socialist emulation has been and remains one of the most vivid manifestations of this attitude.

Everybody appreciates that people work better and with more pleasure where they sense constant efforts to improve the conditions of their work and life. Regretfully, we still have economic executives who feel that these are minor matters. This attitude is fundamentally wrong and harmful. The Political Bureau of the Central Committee has time and again taken such executives, including ministers, to task.

Distribution has been and remains a sphere to which the Party accords special attention. Under socialism the main criterion of distribution can only be

work—its quantity and quality. Regretfully, this is not always the case in practice.

Our system of material and moral incentives should always and everywhere ensure a just and objective evaluation of the labour contribution of each and every person. All organisational, fiscal, and juridical levers should be used to close once and for all every opening for parasitism, bribery, profiteering, unearned incomes, and infringements upon socialist property.

One of the most noteworthy features of the Soviet way of life is the growth of the benefits that people get from *social consumption funds*. During the past five years they have increased by nearly one-third and this year alone they will amount to 121,500 million roubles. This is an enormous sum of money.

Housing, as you know, is a major item of our social programme. As I have already noted, during the past five years housing construction has been proceeding on a huge scale; this scale will be maintained nationwide.

In the period under review, the instructions of the 25th Congress of the CPSU concerning the *development of public education* have, on the whole, been successfully carried out.

A major goal has been achieved — the transition to compulsory universal secondary education has been consummated. Today the main thing is to improve the quality of instruction and of work-oriented and moral upbringing in schools, to do away with formalism in assessing the results of the work of teachers and pupils, strengthen the link of education with life in practical terms, and prepare schoolchildren better for socially useful work.

The 25th Congress called concern for the *health of Soviet people* one of the most important social tasks. In 1977 the CPSU Central Committee and the Government adopted a detailed decision on measures aimed at further improving the public health system. Its implementation is yielding results. Today, in the course of a single shift, our polyclinics can serve half a million more people than five years ago.

However, there are still many shortcomings. The work of polyclinics, prophylactic centres, and outpatient clinics, which serve 80 per cent of all sick people, should be substantially improved.

Concern for people's health is inseparable from the development of *physical culture and sport*. Nonetheless, for most people sport is still only a spectacle. This situation should be corrected. Physical culture should be part of the everyday life of large segments of the population, particularly of children.

The fact that the cultural life of Soviet society is becoming more diversified and richer is an unquestionable achievement of our workers in culture, of our *literature and art*. It seems to me that all readers, theatre and TV audiences, and radio fans feel that a new tide is rising in Soviet art. Many talented works have been produced in recent years — in all our republics. This concerns literature, the theatre, cinematography, music, painting and sculpture.

Our critics, literary journals, unions of workers in the arts and, above all, their Party organisations should be able to correct those who are carried away in one direction or another. And, it goes without saying, they should take an active, principled stand in cases when works appear that discredit our Soviet reality. On this point we should be firm. The Party was not and can never be indifferent to the ideological orientation of our art.

True to the Leninist policy in culture, our Party takes a solicitous and respectful attitude to the artistic intelligentsia and orients it on the fulfilment of lofty creative tasks. This contributes to the further consolidation of the body of artistic workers and to the advancement of society's intellectual life. There is no doubt that Soviet workers in culture will gratify us with new artistic discoveries.

Most Soviet people work honestly, with heart and soul. By right they enjoy — and do so reasonably — the many benefits that society gives them and look after and multiply our national wealth. But there are people who seek to give less to the state and take as much as they can from it. Drinking inflicts considerable damage on society and painfully hurts the family. All work collectives, all public organisations, and all Communists should do everything to combat this ugly phenomenon.

The most significant changes in the economic, public, and intellectual life of Soviet society and the profoundly democratic character of the state of the whole people are telescoped in the new Constitution of the USSR.

A new phase commenced in the work of the *Soviets of People's Deputies* with the adoption of the Constitution of the USSR and then of the constitutions of the Union and autonomous republics. By coupling legislation, administration, and supervision, the Supreme Soviets actively guide the work of the Councils of Ministers, the ministries and the departments. An immensely useful effect is produced by the present renewal of Soviet legislation on the basis of the Constitution.

There is much of interest and new in the work of the local Soviets.

All-embracing *people's control* of the work of administrative bodies and officials is an essential component of Soviet democracy. Not a single violation, not a single case of abuse, wastage, or indiscipline should be overlooked by the people's control inspectors.

In strengthening socialist legality and law and order a great responsibility devolves on the *organs of justice, the courts, the procurator's office, and the Soviet militia*. In this matter the organs maintaining law and order will have the total support of the Party and, I have no doubt, of all our people.

The intensity of the class struggle on the international scene makes high demands on the work of the *state security agencies* and on the Party staunchness, knowledge, and style of work of their personnel. The State Security Committee of the USSR operates efficiently, on a high professional level, and abides strictly by the provisions of the Constitution and the norms of Soviet legislation.

In the period under review the Party and the Government did not for a single day lose sight of questions related to *strengthening the nation's defence potential, its Armed Forces*. The international situation obliges us to do this.

The combat potential of the Soviet Armed Forces is a durable alloy of high technology, military skill, and indomitable morale.

It so happens that the opening of our Congress coincides with Soviet Army and Navy Day. Permit me to extend warm congratulations to our country's glorious defenders on behalf of all the delegates. The Party's Central Committee is confident that they will continue dependably to guard the peaceful, constructive work of the Soviet people.

The Constitution of the USSR has greatly enhanced the role of public organisations in the development of our democracy. The largest of these are the *trade unions*. Now that they have enrolled the millions of collective farmers, the trade unions embrace practically all the working people.

The Party regards the trade unions as a pillar of support among the masses, as a powerful means of promoting democracy and drawing people into the building of communism. One of Lenin's precepts was: "Contact with the masses, i.e., with the overwhelming majority of the workers (and eventually of all the working people), is the most important and most fundamental condition for the success of all trade union activity." I hope every trade unionist will always and in everything check his actions with this behest of Lenin's.

There are more than 40 million young men and women in the *Leninist*

Young Communist League. The most important, the central task of the YCL is to help form the rising generation into politically active, knowledgeable people, who like and know how to work and are always prepared to defend their country. On the whole, the YCL is coping with this task.

It is no secret that some educated and well-informed young people are at the same time politically naive, and their professional training goes along with an insufficiently responsible attitude to work. Much of this is a result of omissions by the YCL.

Consequently, more emphasis should be placed on educational work. I have in mind labour training, moral upbringing, and ideological and political education. In this lies the sure guarantee that Soviet young people will always hold high the banner of communism.

IV. THE PARTY—VANGUARD OF THE SOVIET PEOPLE

The Communist Party grows, gathers strength, and matures together with our society's development, with the changes in its socio-political and cultural make-up.

In the period under review the membership of the CPSU grew by 1,800,000. Today it has 17,480,000 members.

During the past five years the CPSU has been joined by more than 1,500,000 of the finest members of the working class: this comprises 59 per cent of the newly admitted members. Of the new members over 10 per cent are collective farmers. The influx of members of the Soviet intelligentsia continued. Almost three in four of those who joined the CPSU during these years were members of the Leninist YCL.

The finest, most advanced people join the Party. However, stray and unworthy people sometimes get into the CPSU. Let me give you one figure. Since the 25th Congress nearly 300,000 people have been expelled from the Party for deeds incompatible with the calling of Communist.

It must be stated categorically that our attitude to people who comport themselves unworthily and violate the Party Rules and the norms of Party ethics was, is, and will be irreconcilable.

It the period under review there were 11 plenary meetings of the Central Committee. They were convened regularly and the discussions were conducted in a businesslike manner and in a spirit of self-criticism. In short, we have abided by Leninist norms and traditions.

In the period under review there were 236 meetings of the *Political Bureau*. Its work was concentrated on key issues linked to the practical fulfilment of the resolutions of the 25th Congress of the CPSU and plenary meetings of the Central Committee, to new developments in home and foreign policy.

The Political Bureau may be described as the militant headquarters of our many-million-strong Party. It accumulates the collective wisdom of the Party and gives shape to Party policy expressing the interests of the whole of Soviet society, of all Communists and non-Party people.

The selection of personnel, organisation and inspection, and practically all the current questions of Party life comprised the round of work of the *Central Committee Secretariat*. During the period under review it held 250 meetings.

The Political Bureau and Secretariat of the Central Committee showed constant concern for *enhancing the role and responsibility of the republican,*

territorial, regional, district, town, and urban-district Party organisations. The state of affairs in the localities was studied in detail and the reports of many Party committees were examined. Conclusions binding on the entire Party were drawn on the basis of thorough, comprehensive discussion.

The report gives concrete facts about the valuable and instructive undertakings of a number of Party organisations.

In the period under review considerable work has been accomplished to secure a further *improvement of the qualitative composition and placing of executives*, to enhance their qualifications.

In accordance with the instructions of the 25th Congress, many specialists working in the economy were assigned to Party work. L. I. Brezhnev noted that a segment of the specialists who have come into the Party apparatus from industry do not have sufficient political experience and, in some cases, bring economic management methods into Party organs. It is necessary to improve the political training of these comrades and help them to acquire the necessary experience of Party work, the speaker emphasised. The report draws attention to the fact that so far not all the possibilities are being used to promote women to executive posts. It is noted that verification of fulfilment is still a weak spot in the work of a large number of Party organisations.

When the preparations for the 26th Congress were started, continued L. I. Brezhnev, the Central Committee called upon all Communists to hold *election meetings*, to discuss the Central Committee draft for the Congress creatively and self-critically, as far as possible in relation to realities, to the specific questions uppermost in the minds of Communists. In most cases they were highly productive.

Letters and suggestions from citizens are an immensely important channel of the Party's living bond with the masses. In the period under review this work was considerably improved, owing, in large part, to the formation of a Letters Department in the Central Committee apparatus.

It is the duty of every Party functionary, of every leader to the people and the party to examine letters, requests, and complaints from citizens with tact and consideration.

I emphasise that this concerns letters that are sincere and honest. As regards all sorts of anonymous vilifications, the Party stand is well known: there should be no room for them in our life.

The instructions of the 25th Congress of the CPSU stimulated the extension of *criticism and selfcriticism* in the Party. Any attempt at persecution for criticism must be resolutely cut short.

The conditions in which all of us live and work have lately undergone significant changes. The Soviet citizen has changed. He is more knowledgeable and informed, and his intellectual requirements have grown considerably. In view of this the Party's Central Committee has formulated the *tasks to improve ideological work and political education*. These are spelled out in the CPSU Central Committee's decision of April 26, 1979. This is a long-term document.

It is very important that propaganda should not shun sensitive issues and should not be afraid to deal with what are termed difficult questions. Ideological education must be conducted in a vivid and interesting manner, without stereotype phrases and a standard set of ready-made formulas.

In the period under review much attention was given to *Party education*.

Nearly 23 million people are studying in the Party education system. A set day for political education has been introduced practically everywhere.

In Party education the main criterion is, I would say, the results it yields. What do we want to achieve? We want Party policy to fuse with the activity of

the masses. We want Party education to teach people, to use Lenin's words, "to act in the way communism really demands". This is our aim. But this is not always the situation everywhere.

The Marxist-Leninist party cannot fulfil its role if it does not give due attention to putting into proper perspective all that is taking place, to generalising new phenomena, to *creatively developing Marxist-Leninist theory*. Since the 25th Congress the Party's theoretical armoury has been augmented with a number of significant generalisations and conclusions. Of what has been accomplished in the field of theory, mention must be made, in the first place, of the elaboration of the conception of developed socialism. On the basis of this conception, the Party has spelled out and specified the ways and time limits for the attainment of our programme aims, and defined long-term strategy and tactics.

But far from everything in the sphere of social science is satisfactory. The inclination towards scholastic theorising, mentioned also at the 25th Congress, has not been entirely surmounted. Developments in society's political life must be analysed more profoundly and with greater courage. Little is still being done to study public opinion.

The Central Committee believes there is one more major question of significance to the whole Party that must be brought up for discussion. On the whole, the present Programme of the CPSU correctly mirrors the laws of social development. But 20 years have passed since it was adopted. In that time extensive experience has been accumulated of socialist and communist construction in the USSR.

Evidently, the Programme should clearly identify the changes that have taken place in the structure of our economy and underscore and specify long-term aims.

New and fundamentally important phenomena and processes have appeared also on the international scene.

We apparently *should introduce the necessary amendments and additions into the present Programme. If this proposal is approved by the delegates to the Congress, the Central Committee could be instructed to redraft the Programme of the CPSU.*

* * *

Our aim is communism and it is a majestic aim. Every labour achievement, every year of heroic accomplishment, and every five-year plan brings us nearer to that aim. This is the standpoint from which the Party assesses the coming five-year period. Much will have to be done. The tasks that will have to be fulfilled are big and complex. But we will most definitely carry them out.

Soviet people look to the future with confidence. But their optimism is not the self-confidence of favourites of destiny. Our people know that everything they have has been created by their own labour and protected by their own blood. Also, we are optimists because we have faith in the power of labour, because we have faith in our country, in our people. We are optimists because we have faith in our Party and know that the road it is indicating is the only sure one.

Honour and glory to the Communist Party of the Soviet Union, a party of builders of communism!

May our great country, the Union of Soviet Socialist Republics, continue to grow stronger and flourish!

Long live peace!
Long live communism!

(L. I. Brezhnev's report was heard with great attention and repeatedly punctuated with prolonged applause.)

FOR STRENGTHENING PEACE BETWEEN NATIONS

International Lenin Peace Prizes were awarded for outstanding service to the struggle for peace to (from left to right, top to bottom):

Urho Kaleva Kekkonen, President of the Republic of Finland;

Le Duan, General Secretary of the Central Committee of the Communist Party of Vietnam;

Miguel Otero Silva, writer and public figure (Venezuela);

Hervé Bazin, writer and public figure (France);

Abdul Rahman al-Khamisi, writer and public figure (the Arab Republic of Egypt).

THE FLAG AND EMBLEM

The flag of the USSR is red, the colour of the blood shed by those who fought for a better future for mankind. The symbol of revolution since the days of the Paris Commune, the red banner accompanied the Russian working class throughout its prerevolutionary history. It was carried by strikers and demonstrators, it was hoisted over the barricades in Moscow in 1905, and in 1917 it inspired those who accomplished the Great October Socialist Revolution. That is why the red flag has ever since been the state flag of the world's first socialist country. The golden hammer and sickle depicted on it symbolise the alliance of the working class and the peasantry and the five-pointed star— the unity of working people on all five continents.

The state emblem of the USSR is a hammer and sickle on a globe in the rays of the sun and framed by ears of wheat round which is wound a red ribbon bearing the inscription "Workers of All Countries, Unite!" in the languages of all the Union Republics.

But why the hammer and sickle and not a tractor and pneumatic drill, or a combine and rolling mill? In other words, why not more modern tools, something giving an idea of the country's present level of technology?

When the draft of the Soviet Constitution was being discussed in 1936 workers wrote to a Leningrad newspaper:

"The fact that the hammer and sickle are outdated instruments whereas the combine is a modern machine is unimportant. The hammer and sickle are not meant to symbolise technology but the eternal alliance of the working class and the peasantry. Our mothers embroidered this emblem and the slogan 'Workers of all countries, unite!' on a length of red cloth and it became the banner which our fathers carried into battle and in the name of which they died. Let our emblem remain unchanged and bear the same meaning for our children and grandchildren."

THE BATTLE OF KULIKOVO

Dmitri Donskoi, Grand Prince of Muscovy (painting by Ilya Glazunov)

Near the Donskoi Monastery in Moscow

On September 8, 1380, on the upper reaches of the river Don in the very heart of Russia the forces of Prince Dmitri routed Khan Mamai's army in a fierce engagement at Kulikovo (Snipe's) Field. The victory marked the liberation of the Russian people and other peoples of Europe from 300 years of oppression by the Golden Horde. From that day on Prince Dmitri came to be known as Dmitri Donskoi (of the Don). Hundreds of thousands of fighting men laid down their lives on the field overgrown with feather grass of Kulikovo Field.

In the middle of the field today there stands a metal obelisk under a gold-plated cupola commemorating that great event. The field has been ploughed over countless times in the course of centuries but feather grass—a living remembrance of those long-gone days—still grows at the base of the obelisk.

Duel between the Russian champion Peresvet and the Tatar Chelubei (painting by Ilya Glazunov)

A herald (painting by Ilya Glazunov)

Monument to Dmitri Donskoi

Kulikovo Field (painting by Ilya Glazunov)

Land and Population

The Soviet Union extends over an area of 22,400,000 square kilometres—one-sixth of the world's land mass; its population is 264,500,000.

Location and boundaries. The country embraces half the land mass of Europe and one-third of Asia, stretching for 5,000 km from South to North and 10,000 km from East to West. It has eleven time zones.

The USSR has common frontiers with 12 countries. The total length of its state frontiers is more than 60,000 km, two-thirds of which are coastal.

Geography

Relief. The Soviet Union could be described as an amphitheatre raised in the South and East and dipping to the North and West. The East European, West Siberian and Turan plains as well as the Central Siberian Plateau are bordered in the South and East by the Caucasian, Pamir, Tien Shan, Altai, Sayan, Far East and Kamchatka mountain ranges.

The climate is extremely varied. The northern coast washed by the seas of the Arctic Ocean lies in the severe Arctic climate zone. The climate of the southern regions is subtropical: the southern shore of the Crimea and the valleys of Soviet Central Asia have a dry subtropical climate, while the Black Sea coast of the Caucasus has a humid subtropical climate. The climate in most parts of the country is temperate.

Rivers and lakes. There are nearly 150,000 rivers over 10 km long, their total length being three million kilometres. The largest rivers are the Ob, Lena, Amur, Yenisei and Volga.

A network of canals links rivers of the European part of the USSR into a single water transport system connecting the White, Baltic, Caspian and Black Seas and the Sea of Azov. The water power reserves of the USSR make up almost 11 per cent of the world's total.

The countryside in Northern, Central and Southern Russia

The largest lakes in the USSR are the landlocked Caspian and Aral Seas and lakes Baikal, Ladoga, and Balkhash.

There are about 1,000 man-made reservoirs in the Soviet Union. The largest are the Bratsk and Irkutsk reservoirs on the Angara, the Krasnoyarsk reservoir on the Yenisei, the Kuibyshev and Volgograd reservoirs on the Volga and the Bukhtarma reservoir on the Irtysh.

Deserts occupy 300 million hectares. Their cultivation has become particularly intensive in recent years. In Soviet Central Asia and Kazakhstan deserts provide pastures for sheep, goats, cattle, horses and all the camels. Cotton, rice, vegetables and fruit are grown on the cultivated lands.

Gas pipelines stretch across deserts from South to North and canals from East to West. Canals change the flora and fauna as well as the whole microclimate of the region they pass through. Nearly 7 million hectares of the desert area is irrigated by canals. Soon water from the Kara-Kum canal will reach the centre of the Kara-Kum Desert where water wells go 260 metres deep. For this purpose a 200-kilometre pipeline is now being built.

Almost 100,000 hectares of virgin lands are brought under cultivation every year in Uzbekistan alone. Steppes and deserts are put to agricultural use. In years to come you will hardly be able to imagine what these

lands were like before blooming oases were created here.

It looks like a wonder—an island of old-age desert preserved amidst vineyards and orchards, cotton and vegetable fields, close to populous settlements and industrial towns.

Central Fergana is a severe and wild land. It used to be vast in old times. Today much of the land has been cultivated and sown to crops. However there are at least 600 square kilometres of land preserved as it used to be centuries ago and surrounded by orchards and vineyards, cotton and vegetable fields. Here one may find towering sandhills and dunes, beds of abandoned dried rivers, salt flats—takyrs, and many unique species of animals and plants.

Today Uzbek scientists are debating whether this island of desert should be preserved for future generations.

Vegetation. One-third of the world's forests lie in the Soviet Union. One-third of the territory of the USSR is forestland. Most of the forests lie in the European North, in Siberia and in the Far East.

In the North and South the forests merge into tundra and steppe respectively.

About 20,000 species of plants are found in the Soviet Union, including almost half of all the families of plants known in the world.

Animal life. Altogether 286 species and subspecies of animals threatened with extinction are registered in the international "Red Data Book". Twenty-one of them are found on the territory of the Soviet Union. They include the polar and brown bear, the Amur tiger—one of the largest beasts of prey, the snow leopard who lives in mountains at altitudes of over 4,000 metres, the leopard—the most beautiful cat, the steppe lynx—caracal, the swift-footed cheetah, the red mountain wolf, the black stork, the Kulan donkey, which is swifter than a horse, the desman, the northern reindeer, the Dzheiran antelope, the Atlantic Polar walrus and rare species of seal from the Kuriles and the Black Sea... Of the three herds of fur seals still left in the world, two are to be found on Soviet islands in the Pacific.

In the USSR not a single animal species has become extinct during the Soviet period. Forest reserves made it possible to restore the population of sables which were on the point of extinction at the beginning of this century. Herds of bison, contemporary of the mammoth, and not so long ago an almost extinct animal, are steadily growing. The population of the beaver and the fur seal has considerably increased and herds of elk, deer, antelope and wild boar are now more numerous than they used to be. Altogether 18 very rare species of animals and 30 species of birds have been prevented from becoming extinct and their population has been restored.

There are about 1,500 species of fish in the Soviet Union and over 250 of them are of commercial importance.

Every year 140 fisheries release approximately 12,000 million fry of sturgeon, salmon, pike perch, bream and other species of fish into water reservoirs.

Animals and fish are transported to new places of habitation. Far Eastern salmon has been taken to northern seas, while whitefish and silver carp are making themselves at home in Soviet Central Asia, carp, pike perch and bream in man-made lakes in Siberia and Kazakhstan, and grey mullet in the Caspian Sea.

Mineral resources. The Soviet Union has the world's largest reserves of coal, natural gas, iron and manganese ores, of apatite, asbestos and many other minerals. Its proved reserves of iron ore constitute over 40 per cent of total world deposits. The richest are the Krivoi Rog fields in the Ukraine and the Kursk magnetic anomaly in the centre of European Russia.

The Kursk magnetic anomaly produces 45 million tons of ore annually. Its resources are virtually inexhaustible. The largest manganese ore deposits are in the Ukraine and Georgia. The Urals and Kazakhstan are very rich in chromites. Deposits of nickel, cobalt, molybdenum and tungsten are found in the Kola Peninsula, the Urals, Kazakhstan, Transcaucasia, Siberia and the Soviet Far East. Bauxites—the most important raw material of the aluminium industry—are found in the Urals, the European North, Kazakhstan, Siberia and the Caucasus. Copper deposits are being extensively mined in the Urals, Kazakhstan, Uzbekistan, Armenia and Northern Siberia. Lead and zinc ores which not infrequently contain a significant admixture of many precious metals have been discovered in Kazakhstan, where almost all the elements in the Mendeleyev Table are found, Central Asia, the North Caucasus, Siberia and the Far East. Tin ores are concentrated in the mountains of the Pacific belt.

The USSR has more than half the world's phosphorite deposits and two-thirds of its potassium salts. The Urals are rich in emeralds, rubies, malachite, jasper and other precious and semi-precious stones. The Soviet Union also has deposits of diamonds. The USSR is a major producer of gold.

Oil and natural gas deposits are being tapped in Western Siberia, in the Volga region and the Urals, in the Caucasus and Central Asia. There are coalfields in the Ukraine, Kazakhstan and Siberia.

Four new major deposits of copper, coking coal, iron ore, lead, zinc and tin ores have been discovered in Siberia. In surveying these deposits geologists were helped by space photography.

Nature conservation is considered a matter of state importance. This task is tackled in a comprehensive manner over large regions. The Moscow region may be taken as an example.

In the parks of Moscow you can hear a nightingale singing. Swallows, which are most difficult to please in the environmental respect, are building their nests in the Kuskovo park. Elks and roe deer from the forests surrounding Moscow sometimes find their way into city streets. Wild ducks are living and breeding on ponds in the capital.

Muscovites have never known what smog is. There are 37 square metres of greenery for every inhabitant of the city; 200,000 trees and 1,500,000 shrubs are planted in Moscow every year. Parks and gardens constitute one-third of the city's territory. Moscow consumes five million cubic metres of water a day, and the same quantity of sewage passes daily through the purification installations.

Despite the impressive growth of the city's industrial potential and an increase in the number of cars—up to 400,000 at rush hours—the city air is clean. Control over the content of toxic substances in exhaust fumes has been introduces and some motor vehicles have switches to liquified gas. Electric cars are being put into service. Moreover, many motor vehicles have been fitted with neutralizers capable of removing carbon dioxide and hydrocarbon from exhaust fumes.

In the past ten years 1,200 fume and dust trapping installations have been built or modernised in Moscow and 4,500 minor boiler-houses, many of which used coal, have been closed down. Moscow's flats are heated by 15 heating plants using natural gas. More than 400 industrial enterprises which polluted the environment have been moved beyond the city limits.

The forests are well kept and their area is being expanded all the time. In the Moscow region more than 38 species of animals and almost 100 bird species may be found, including elks, wild boar, foxes, hares, squirrels, hazel grouse and black grouse. Bison brought from Byelorussia have settled in the region.

Population

The Soviet Union has the third largest population in the world after China and India—264,500,000 on January 1, 1980.

Twenty million Soviet people were killed in the Great Patriotic War (1941-1945). The prewar population level was reached only within ten years.

The country's population growth rate. Considerable improvement in living conditions, free medical service, mother and child care and the state social security system have resulted in a sharp decline in the mortality rate. The average life expectancy has risen to 70 years. There are 20,000 men and women over 100 years of age and nearly 400 over 120 years of age.

There were years in the USSR's history when the birth rate dropped. The lowest birth rate was in 1943 and 1969. In 1943 the war was raging and millions of young men were killed. By 1969 the children of those who were not born because of the war should have been born.

Every 20-25 years the country's demographic processes are influenced by the consequences of the war.

Now, 18-year-olds constitute the largest age group in the Soviet Union. As distinct from previous years there is a preponderance of young men in this group: there are 87 girls per 100 boys born in 1960. Demographers believe that this factor will tell upon the lives not only of younger women.

The birth rate which has been increasing since 1970 is expected to rise further.

Another decline is expected when the least numerous population born in the late 60s will reach marrigeable age and the shortage of labour is likely to be felt even more strongly.

In the past ten years the country's population has increased by 21 million compared with the increase of 32 million in the previous decade. The population growth rate has decreased and remains at an annual level of 0.92 per cent.

The USSR is implementing the principle of conscious motherhood, according to which all children's births must be desired by their parents. There is heated debate in the press as to how many children a family should have. Two or three children are usually recommended. But complex demographic factors lead to a fall in the birth rate as living standards rise. Moreover, the birth rate is adversely affected by the broad participation of women in agriculture and industry.

Population distribution. Population density is uneven. Some regions of the Russian Federation (the industrial centre), the Ukraine, the Urals and Uzbekistan are as densely populated as the countries of Western Europe. However, in the vast northern areas, in Siberia and some mountain regions the density is less than one person per square kilometre. The average population density is 11.8 persons per square kilometre.

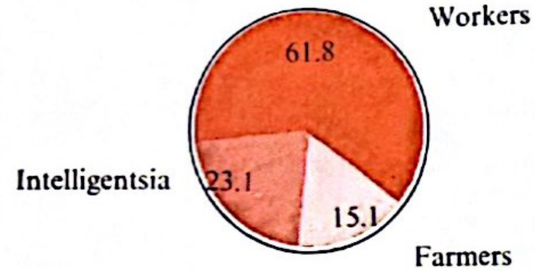
Population
(in millions)

Cities with a population over 1.5 million

Twice as many people live in the town as in the country. There are over 2,000 towns, and twenty new towns spring up every year. There are 272 towns with a population of over 100,000 and 20 cities with a population of a million or more.

National composition. In the Soviet Union there are over 100 nations and nationalities. Along with the larger nations, such as the Russians who constitute more than half the total population or the Ukrainians, who constitute one-fifth, there are very small nationalities numbering less than a thousand people—the Orochi and the Nganasanes—or even a mere five hundred—the Yukagirs.

Social structure of the population
(percentage of total)



The growth of the urban population at the expense of the rural population is continuing. The rural population is decreasing not only relatively but also in terms of absolute numbers—country dwellers are moving to towns and cities. On the one hand, expanding industry requires ever more skilled labour; on the other hand, the mechanisation of agricultural production and heightened productivity of labour make it possible for farmers to do more with less manpower. The population is increasing rapidly in the developing regions of Siberia and the Soviet Far East.

Soviet society is made up of workers, farmers and intellectuals. There are no landowners or capitalists or other persons owning the means of production and exploiting hired labour.

Yukagir women

RUSSIAN SOVIET FEDERATIVE SOCIALIST REPUBLIC

Area—17,075,000 sq. km
Population—137,600,000
Capital—Moscow
(population 8,000,000)

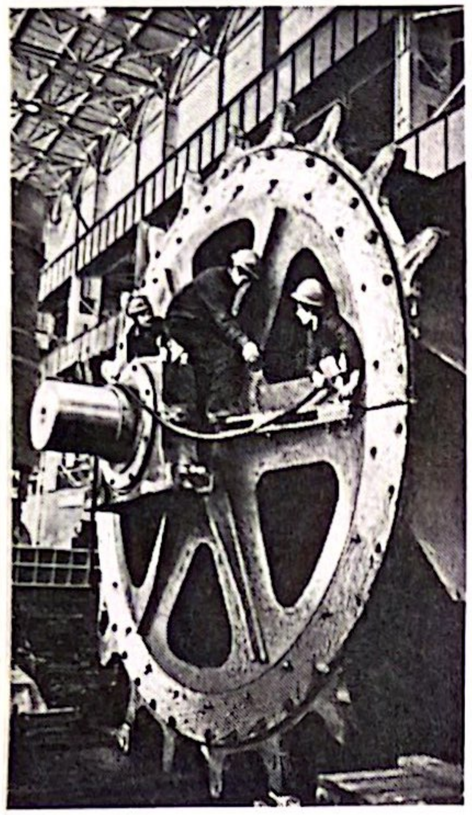
The RSFSR, or Russia, is the largest of the 15 Union Republics. It extends over two continents—Europe and Asia, and occupies three-fourths of the country's territory. Apart from Russians, who account for 80 per cent of the population of the republic there are over 100 other nations and nationalities. The RSFSR has 16 Autonomous Republics, 5 Autonomous Regions, and 10 Autonomous Areas inhabited by national minorities of the North.

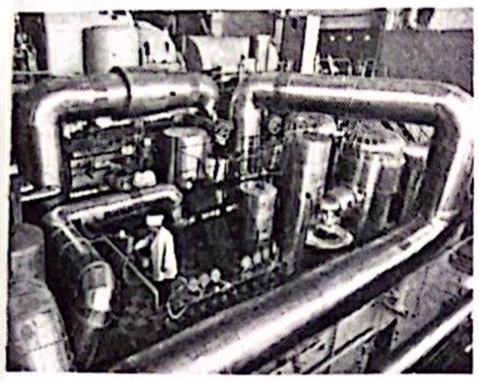
The greater part of the republic is covered with forests. Only in the central black-earth regions and the southern steppes there are boundless fields of wheat and corn. The Volga area and the Northern Caucasus are the country's main granaries. Thanks to irrigation and field shelter belts they have been turned into good farming areas. The non-black-earth zone in the central and northern regions of European Russia yield stable crops of wheat, rye and potatoes and abound in meadows which are used as pasture grounds, although there is also much marshland, and the podzol soil requires fertilising. That is why huge sums are invested in agriculture in this vast area which has a population of 60 million.

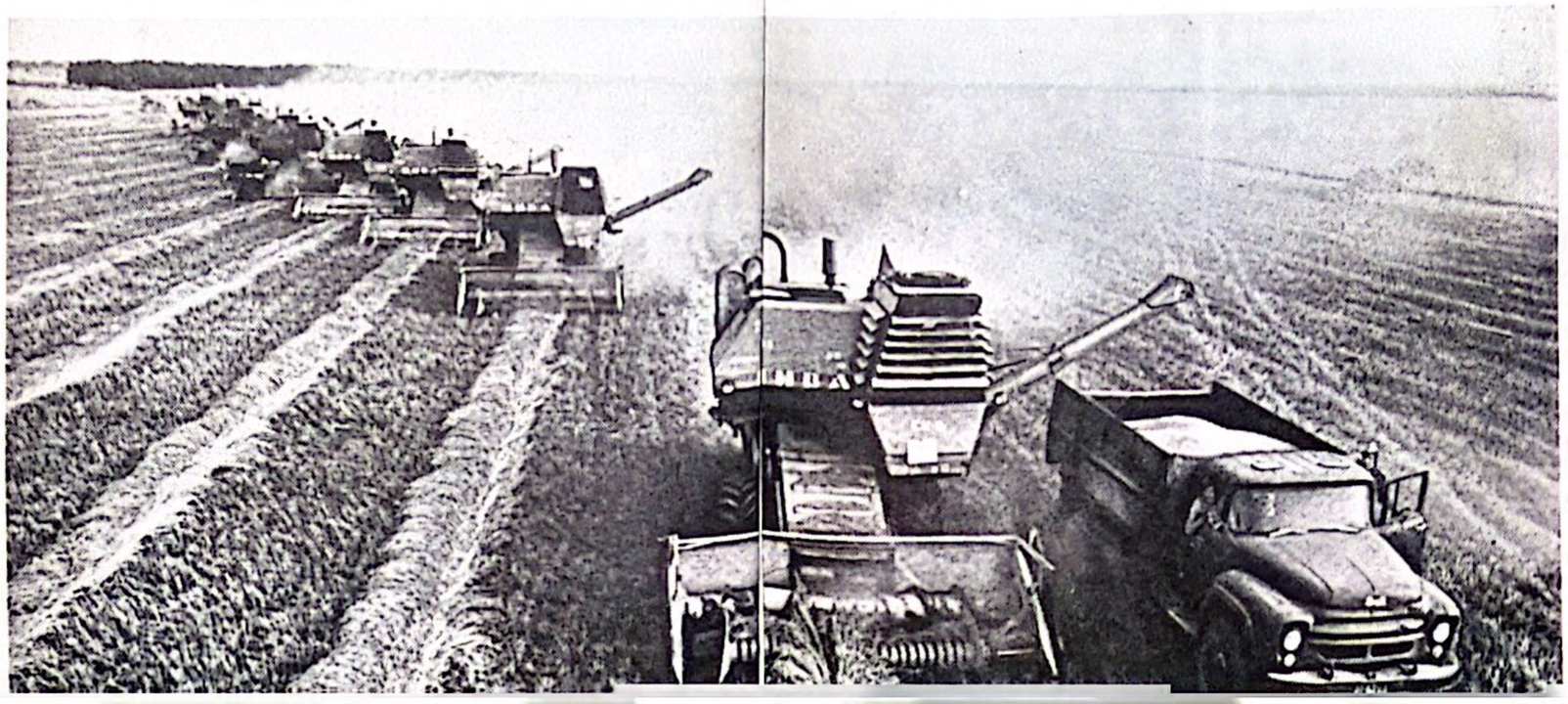
In Siberia the power industry is being developed at accelerated rates. The Krasnoyarsk Hydroelectric Station on the Yenisei with a capacity of 6 million kw, the country's biggest, has been completed, and the first units of the still larger Sayan-Shushenskaya hydropower station are already generating electricity. To facilitate access to the vast natural riches of Siberia—furs, timber, coal, gold, diamonds, etc., the Baikal-Amur Railway is being laid across the primordial taiga, defying permafrost and marshes. More than half of the 3,200-kilometre long track has been built. Industrial cities are mushrooming along the new railway. Unlike the traditional industrial regions in Central Russia and the Urals, centres of the country's steel, heavy engineering and chemical industries, which receive fuel and raw materials from afar, the new cities are well provided with these essentials, for everything is near at hand.

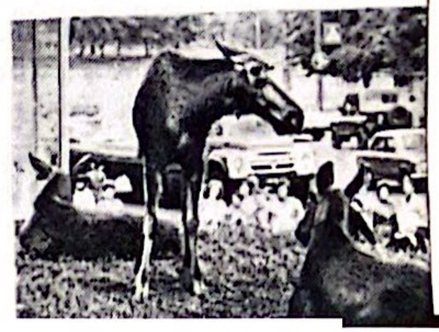
The northern part of Western Siberia, which is now the country's major oil producing region, is becoming industrialised. The same can be said of the Chukchi peninsula, Alaska's Russian counterpart.

At the Uralmash heavy engineering works. Old and new settlements in Tynda on the Baikal-Amur Railway (BAM). Volcanic eruption in Kamchatka. The Bilibino nuclear power station in Chukotka. Combine-harvesters start another day. Russian dance. Oil pipeline under construction in Tyumen. Muscovites are host to elks.









UKRAINIAN SOVIET SOCIALIST REPUBLIC

Area—603,700 sq. km
Population—49,800,000
Capital—Kiev
(population 2,100,000)

The Ukraine accounts for 20 per cent of the country's national income and provides the country with coal and iron ore, cast and rolled steel, diesel locomotives and aircraft, TV sets and refrigerators, sugar and bread grain. There is a series of hydroelectric power stations on the Dnieper, and atomic power plants are being built.

Extensive housing construction is going on in the Ukraine. In Kiev a new flat is tenanted every 15 minutes, the time in which the city receives a new addition to its population. Thus each Kiev baby is born, so to say, with a key to a new flat.

In the major industrial centres—the Donetsk coal and the Krivoi Rog iron ore basins, there are not only coal and iron mines but also metallurgical works and engineering and textile industries. Ninety per cent of the population there live in cities. Donetsk and Krivoi Rog are building twenty-storey houses and sinking 1,000-metre-deep mines. The streets, however, are free of coal dust. Greenery and flowers are in abundance. New road signs have appeared depicting elks which inhabit the surrounding forests that have been planted by man.

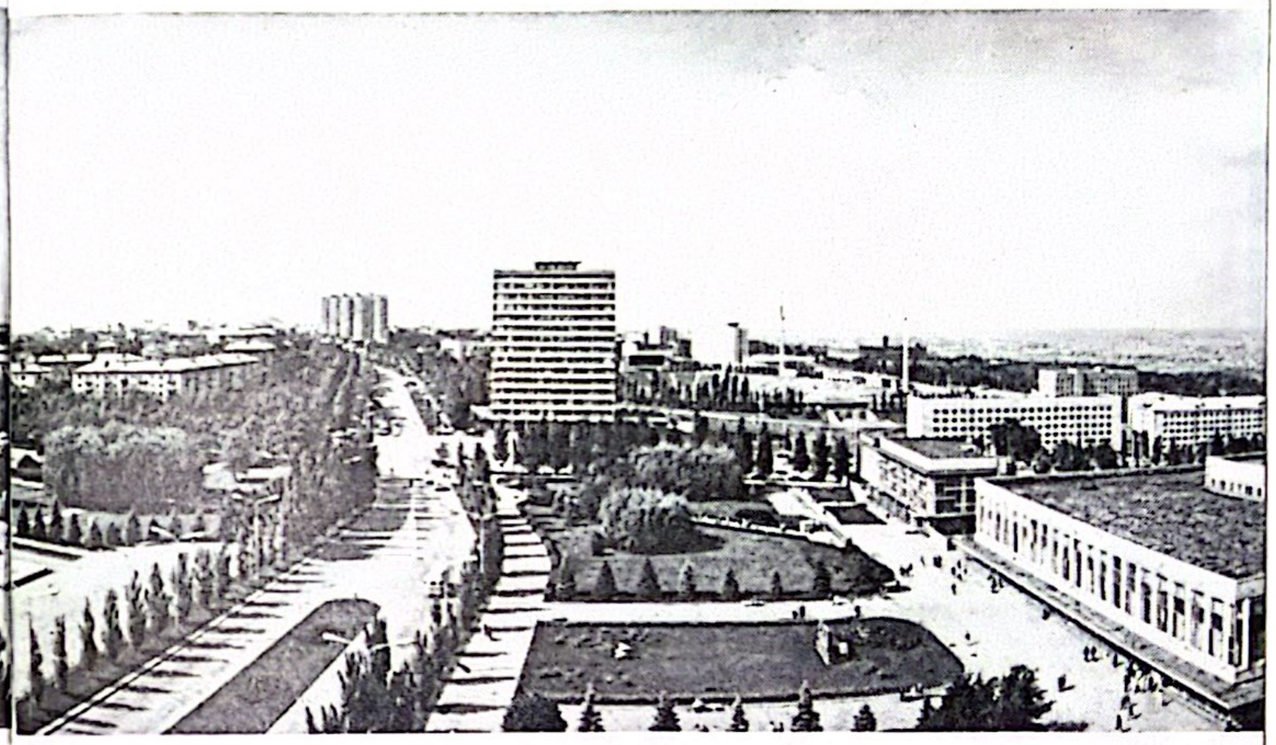
Each autumn as many as 250,000 farmers from all parts of the republic flock to the Bolshiye Sorochintsy village where a fair is held in keeping with all the traditions that were described in the last century by the great Russian writer, Nikolai Gogol. After the wares are sold and the folk festivities and games are over, everyone joins in the abundant open-air feast with national dishes and the Ukrainian *gorilka*—vodka flavoured with red pepper.

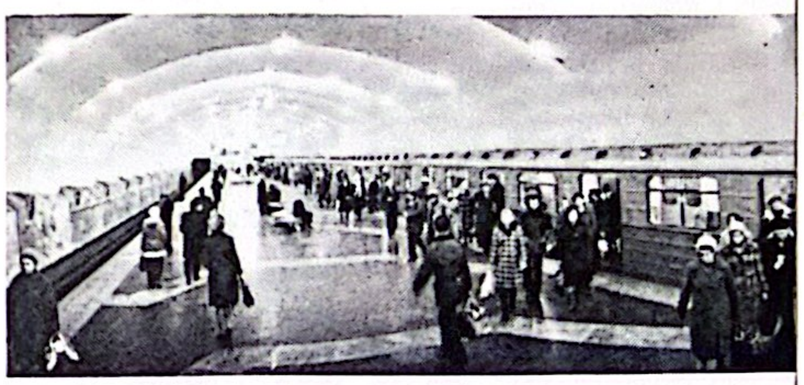
Closed-circuit TV helps students. The new city of Donetsk. In old Lvov. An aircraft plant in Kiev. Sugar-beet harvesting. Metro station in Kharkov. At the Kiev Zoo. The "Melodichiyi" vocal group.

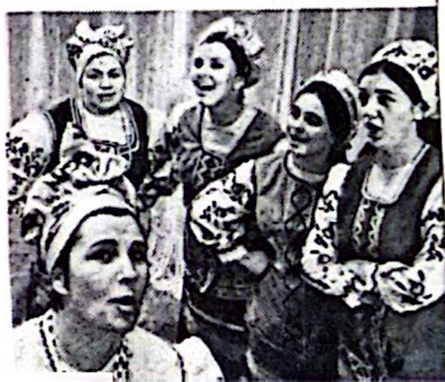
Ukrainians are experienced farmers who know how to grow bumper crops of sugar beet, sunflower, corn and especially wheat. The new high-yield Mironov wheat varieties developed by Ukrainian plant breeders give 100 metric centners per hectare, and they also grow well in other parts of the country.

Ukrainian scientists have set up commercial production of artificial diamonds, worked out methods of plasma and electronic welding and laser bonding in outer space and deep-sea waters, developed a new trend in ultrahigh frequency electronics and are conducting research in advanced areas of cybernetics.

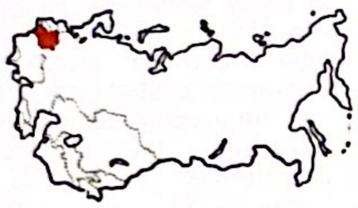
The republic is known for its rich musical culture.







BYELORUSSIAN SOVIET SOCIALIST REPUBLIC



Area—207,600 sq. km
Population—9,600,000
Capital—Minsk
(population 1,300,000)

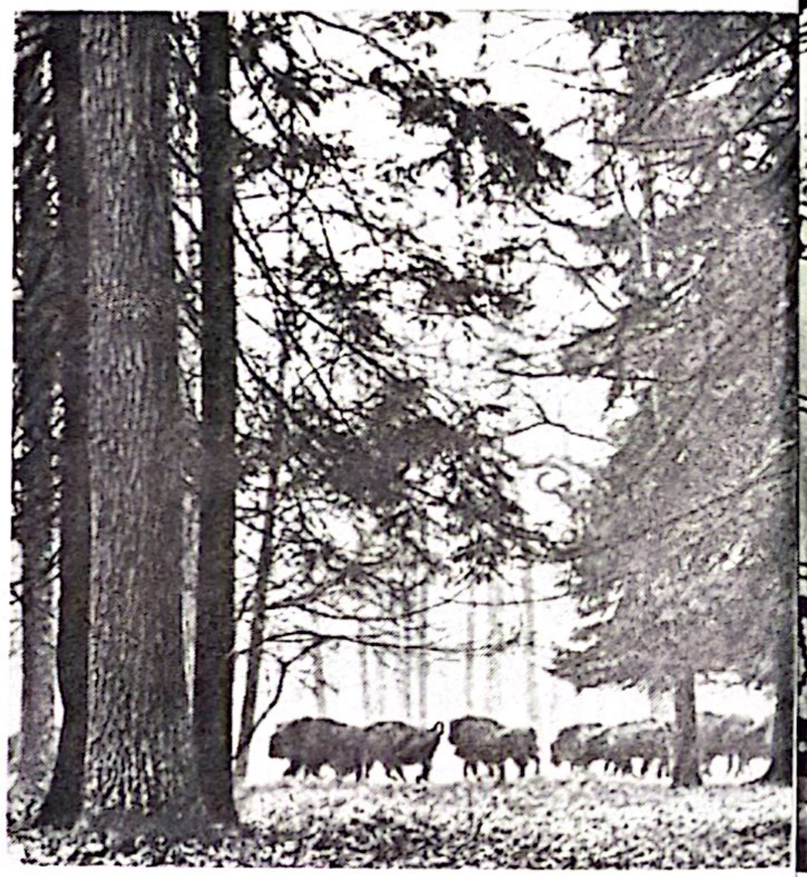
Byelorussia is a land of forests, lakes and rivers. Its southern part, Polesye, is swampy lowland most of which has been drained. The remaining part with its impassable marshes, sands and thick woods is under state protection to ensure the flow of river water and preserve wildlife.

Under the marshlands there are rich deposits of potassium and oil, and industrial complexes have been built in these parts. The engineering industry has also made good progress. The republic produces 75-ton lorries, tractors, electronic computers, TV sets, motor-cycles, etc. The farms provide the cities with meat, milk, potatoes and flax.

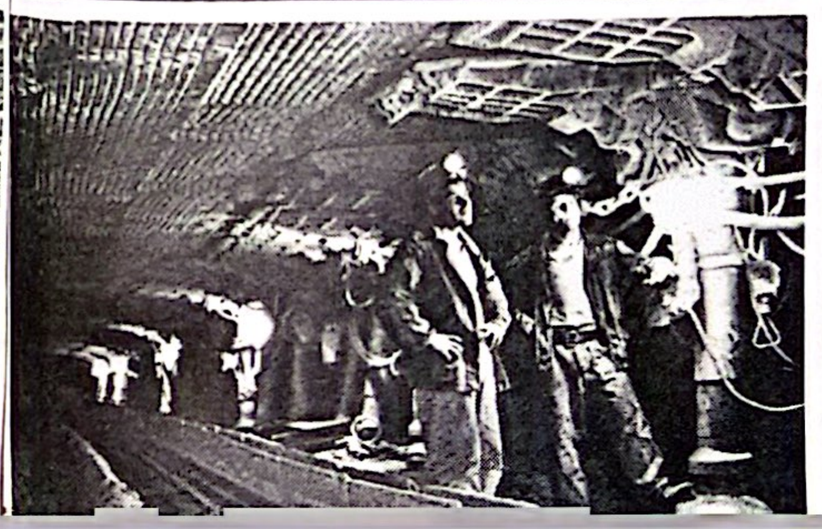
The republic's western extremity is the site of the famous Belovezhskaya Pushcha reservation. Here one finds the red-coloured pine, once a valuable source of ship timber, centuries-old oak forests, water-meadows with rare plant species, and the aurochs, a representative of relict wildlife. And all this exists in the heart of Europe! The valuable vegetation is carefully tended, while the growth of less valuable species is somewhat restrained. The forests are "brought closer" to city limits to improve the city air.

During the Great Patriotic War (1941-1945) about 600,000 Byelorussians fought in Nazi-occupied rear. The partisans disrupted enemy communications and had control of over half of Byelorussia's territory. Every fourth Byelorussian lost his life in the war, and the republic lost half of its national wealth. Five years after the war ended, however, it surpassed its prewar production level.

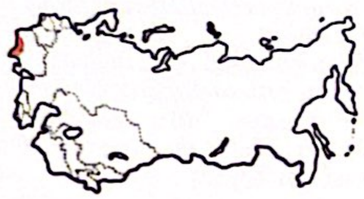
The Byelorussians are famous for their folk dances and fine needlework.



Aurochs in the Belovezhskaya Pushcha reservation. Byelorussian melodies. Memorial to fallen soldiers. Landscape in Polesye. Miners. How the clearing of swamps begins.



MOLDAVIAN SOVIET SOCIALIST REPUBLIC



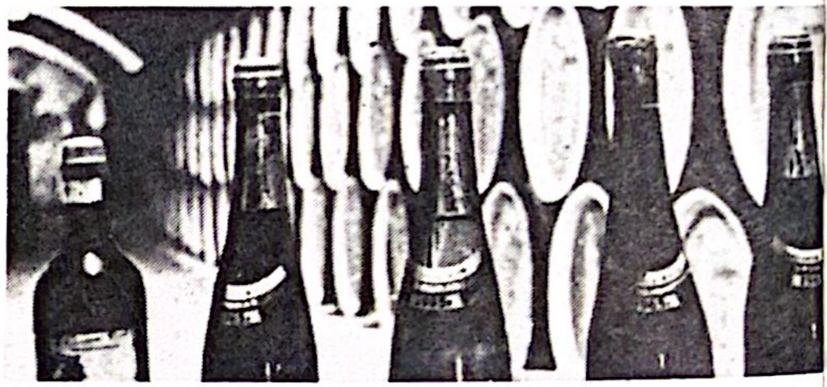
Area—33,700 sq. km
Population—3,900,000
Capital—Kishinev
(population 503,000)

Moldavia is known as the orchard republic. It is the country's leading producer of tinned fruit and vegetables and fruit and vegetable juices, and part of its produce is exported. It has the country's biggest high-yielding vineyards and is famous for its wine-making industry. Dry and sweet wines with the well-known white-stork label account for one-third of the wines produced in the Soviet Union and compete successfully with the best Georgian, Armenian and Uzbek brands. The "Romanesti" wine, known as Soviet claret, has won medals at four international wine fairs.

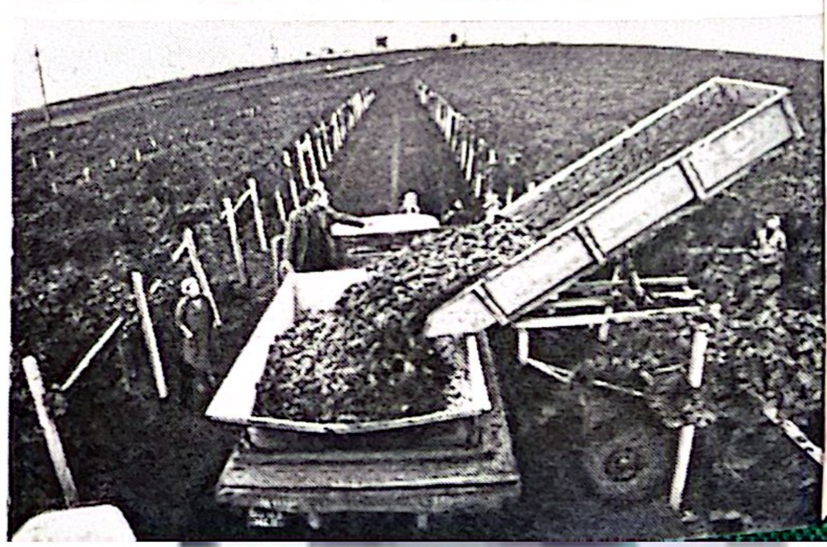
Moldavia's high agricultural yields are due not only to its fertile black-earth soils. Collective and state farms specialising in various branches of agriculture—viticulture, fruit or vegetable growing—pool their resources to build big industrial processing enterprises on a joint-stock basis. These industrial complexes are known as collective-farm or state-farm factories.

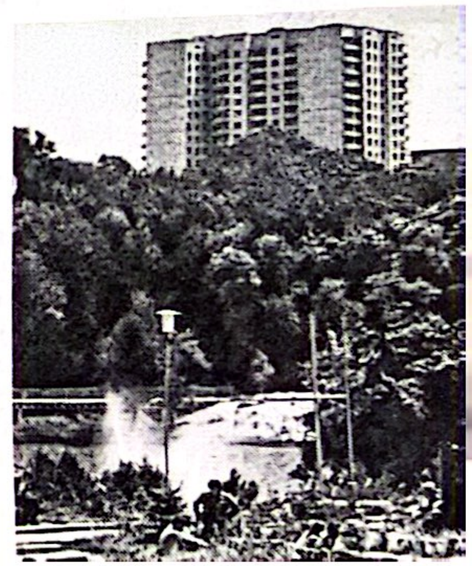
Moldavian scientists help farmers, and especially fruit growers, to increase harvests. They considered as much too small the 500-centner-per-hectare apple yields from collective and state farms, and after reducing the size of the tree crowns and resorting to denser planting, they raised the apple yields to 1,200 metric centners per hectare. When they introduced physiologically active substances that increased the number of fruit buds. The result was that the trees had more apples than leaves, the yields amounting to 2,000 centners per hectare. At the request of their German friends the Moldavians have laid a similar "super-orchard" in the German Democratic Republic.

Despite the fact that Moldavia has little mineral resources of its own, it has a well-developed industry. It makes electric motors, cables, washing machines and refrigerators. The Moldavians are a musical people. Many popular Moldavian melodies are based on national folk songs—the *doynas*.



A ram is a traditional prize in national wrestling. Wine cellars at the Varzaresty state farm. Grape harvest at a collective farm. A merry roundelay. A farmer's cottage. Recreation zone in the centre of Kishinev.





Social and State Structure

The Social System

All power in the USSR belongs to the people. They exercise state power through Soviets (councils) of People's Deputies, representative elective bodies, which form the political foundation of the USSR.

The foundation of the economic system is **socialist ownership** of the means of production in two forms—state property (belonging to all the people) and collective-farm-and-cooperative property. Socialist ownership also embraces the property of trade unions and other public organisations.

Personal property is based on the earned income citizens receive for their participation in socially useful labour. Besides his personal effects a person may own a house, a subsidiary small holding, a car and other items for personal use. Private enterprise employing hired labour and extracting profit is prohibited. The law allows individuals to do farm work, to provide services to the public, to engage in handicrafts and other activities only if these rest exclusively on the personal labour of an individual citizen and the members of his or her family.

The National and State Structure

The USSR is an integral, multinational state formed as a result of the free self-determination of nations and the voluntary association of equal republics in a socialist federation.

The USSR unites fifteen Union Republics: the Russian Soviet Federative Socialist Republic and the Ukrainian, Byelorussian, Uzbek, Kazakh, Georgian, Azerbaijan, Lithuanian, Moldavian, Latvian, Kirghiz, Tajik, Armenian, Turkmen and Estonian Soviet Socialist Republics. A citizen of any race or nationality enjoys the same rights as all the rest, without any privileges.

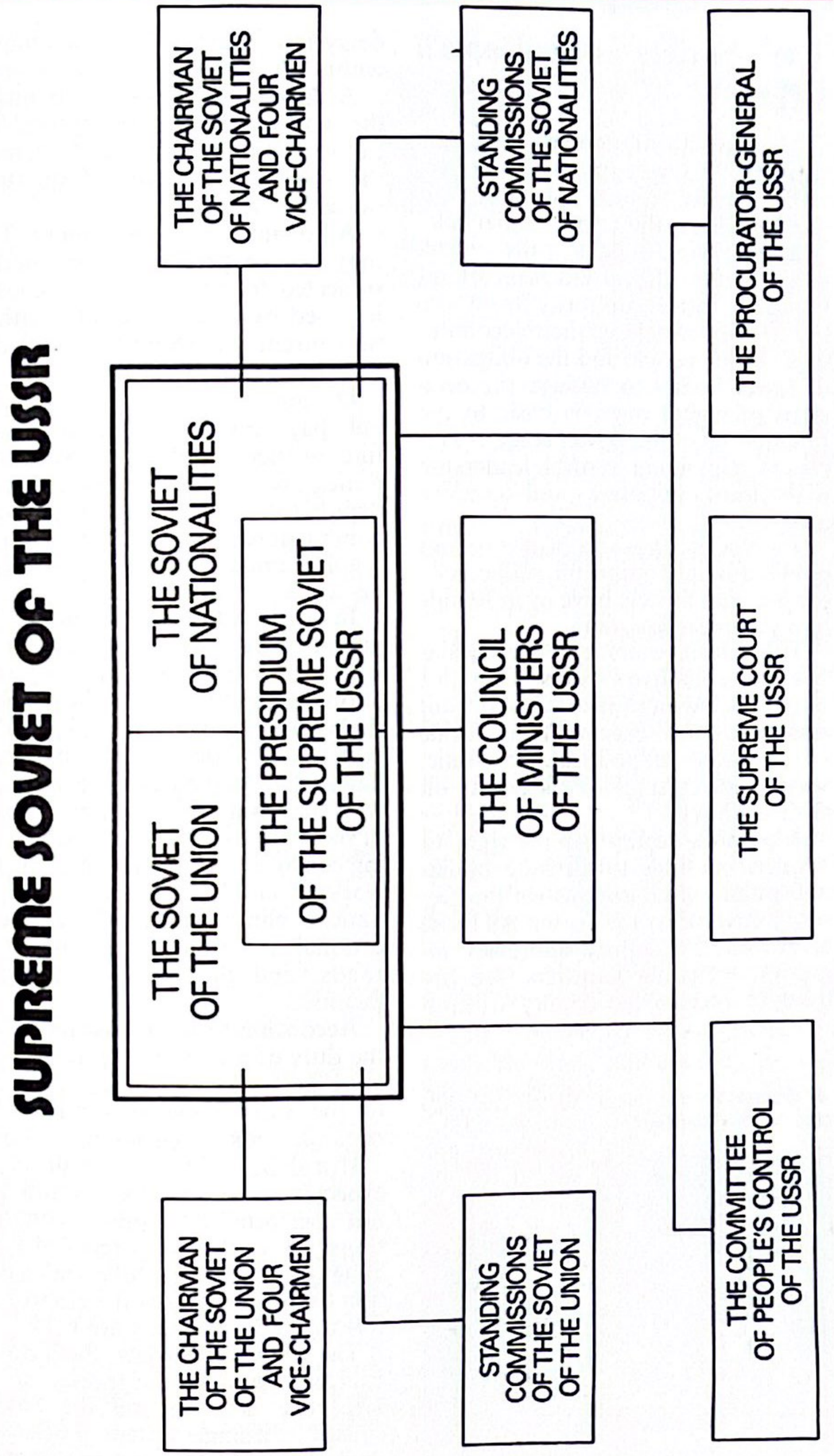
Each **Union Republic** is a sovereign socialist state. It has its own Constitution conforming to the Constitution of the USSR and taking note of specific national, economic or other features of the republic. Each Union Republic has its own highest bodies of state authority—the Supreme Soviet and its Presidium, the Council of Ministers, and its own Supreme Court, its own civil, criminal, labour, family and other laws, its own judicial system and its own anthem, flag, emblem and capital. It has the right to enter into relations with other states and freely to secede from the USSR.

Each **Autonomous Republic** is a national-state entity and an integral part of the Union Republic in which it is incorporated. It also has its own Constitution, its own bodies of authority, its own judicial system, its own laws, and its own capital, emblem and flag.

Each **Autonomous Region** is a national territorial entity which, by virtue of the specific national composition and customs of its population, enjoys admitistrative autonomy.

Each **Autonomous Area** is a national territorial entity which is also distinguished by its specific national composition and customs, but which has a comparatively small population.

Administrative-territorial units in the USSR are villages, settlements, districts in big cities, towns, rural districts and regions; and in the Russian Federation — also areas and territories.


SUPREME SOVIET OF THE USSR
THE SOVIET OF THE UNION
THE SOVIET OF NATIONALITIES
THE PRESIDIUM OF THE SUPREME SOVIET OF THE USSR
THE COUNCIL OF MINISTERS OF THE USSR
THE CHAIRMAN OF THE SOVIET OF NATIONALITIES AND FOUR VICE-CHAIRMEN
STANDING COMMISSIONS OF THE SOVIET OF NATIONALITIES
THE PROCURATOR-GENERAL OF THE USSR
THE SUPREME COURT OF THE USSR
THE CHAIRMAN OF THE SOVIET OF THE UNION AND FOUR VICE-CHAIRMEN
STANDING COMMISSIONS OF THE SOVIET OF THE UNION
THE COMMITTEE OF PEOPLE'S CONTROL OF THE USSR

The Soviets of People's Deputies

The Soviets of People's Deputies constitute a single system of elective, representative bodies of state authority. Hence the term—Soviet rule.

The principle of democratic centralism, namely, the electiveness of all bodies of state authority from the lowest to the highest, their accountability to the people and the obligation of lower bodies to observe the decisions of higher ones, is basic to the functioning of the Soviet state. It also means combining central leadership with local initiative and creative activity.

The Soviets are a school of state and public administration for millions of people. The Soviets have over 30 million volunteer assistants.

The Soviets embrace both legislative and executive powers. They not only pass laws and take decisions but also ensure their execution and decide all questions of political, economic, social and cultural development on their territory.

A people's deputy has the right to address inquiries to all state bodies and public organisations on the territory covered by the Soviet. All those to whom the deputy addresses inquiries, including ministers, are obliged to receive the deputy without delay and to reply to his or her inquiry within three days.

A deputy is authorised to inspect the work of offices, enterprises, collective and state farms and to demand the speediest solution of questions raised by electors.

All deputies enjoy immunity. They may not be prosecuted, arrested or subjected to administrative penalties imposed by court procedure without the consent of the Soviet to which they have been elected.

Deputies exercise their powers without payment and without discontinuing their regular employment or duties. When it is necessary for a deputy to work on one of the Soviet's commissions, he is released from his regular employment while retaining his average earnings.

In their work the deputies are guided by the interests of the state as a whole; they also take into consideration the requirements of the people of their election districts and do their best to carry out the electors' mandates. The mandates as a rule deal with such matters as the improvement of the work of local enterprises, housing construction, extension of the network of children's institutions, outpatient clinics, hospitals and educational institutions, the repair of roads, and the work of transport facilities.

According to the Constitution it is the duty of a deputy to report on his work in the Soviet to his electors and to the work collectives and public organisations which nominated him.

If a deputy fails to live up to the expectations of his electors and does not perform his duties conscientiously, he or she can be recalled at any time from the Soviet following a decision of the majority of the electors. In this case new elections are held.

A deputy to the local Soviet (council) receives his electors

The system of Soviets. Each Soviet exercises supreme authority in its respective area and all the Soviets constitute a single system of bodies of state authority. This system comprises

Composition of the USSR Supreme Soviet

Workers	522	(34.8 %)
Collective farmers	244	(16.3 %)
Non-Party people	425	(28.3 %)
Women	487	(32.5 %)
People under 30 years of age	317	(21.1 %)

the Supreme Soviet of the USSR, the Supreme Soviets of the fifteen Union Republics, the Supreme Soviets of twenty Autonomous Republics and 50,991 local Soviets.

Each Soviet sets up respective bodies of state administration: either Councils of Ministers or executive committees.

The Supreme Soviet of the USSR is the highest body of state authority in the country. It expresses the sovereignty of the whole Soviet people and consists of two Chambers each having equal rights: the Soviet of the Union, representing the common interests of all working people irrespective of nationality, and the Soviet of Nationalities, representing the particular interests of each nationality and national group stemming from the specific features of their economy, history, culture, traditions and customs.

Both Chambers are elected on the same day and have equal terms of office—five years—and equal powers of initiating legislation. A law is considered adopted when it has been passed in each Chamber by simple majority.

The Presidium of the Supreme Soviet of the USSR is a standing body and the highest body of state authority in the country. It is elected at a joint sitting of both Chambers and consists of a Chairman, a First Vice-Chairman, 15 Vice-Chairmen (one from each Union Republic), a Secretary and 21 members. The Presidium is accountable to the Supreme Soviet for all its activities. Between sessions of the Supreme Soviet and within the limits stipulated in the Constitution it exercises the functions of the highest body of state authority.

The Council of Ministers of the USSR, i.e. the government, is the highest executive and administrative body of state authority in the USSR. It is formed by the Supreme Soviet at a joint sitting of both Chambers and consists of a Chairman, Vice-Chairmen, Ministers, Chairmen of State Committees and Chairmen of the Councils of Ministers of the Union Republics. It works on a collegial basis. All its decisions and ordinances are issued solely on the basis of and in pursuance of the laws of the USSR.

The Council of Ministers is responsible and accountable to the Supreme Soviet.

The Supreme Soviets of the Union and Autonomous Republics are the highest bodies of state authority in their respective republics. They have one chamber and are elected for a term of five years.

The rights vested in the Supreme Soviets include adopting the Constitution, issuing the republic's laws, endorsing plans for economic and social development and the republic's budget, and supervising the work of state bodies and officials.

Presidium of the Supreme Soviet of the Tajik Union Republic in session

The Supreme Soviets of the republics form the highest bodies of state authority in the republic—the Presidiums of the Supreme Soviets, the Councils of Ministers and the Supreme Courts.

Local Soviets exercise state authority and independently decide matters that come within their competence in their respective administrative divisions—from a territory to a rural community.

Local Soviets direct state, economic, social and cultural development within their territory, ensure observance of the laws, the protection of citizens' rights and the maintenance of law and order, and endorse plans for economic and social development and the local budget. They are in charge of the land, guide the work of local industry, exercise control over industrial enterprises subordinate to ministries, over clubs, libraries and theatres, organise the work of trading enterprises and educational establishments, ensure adequate health services for the population, and see to the payment of state pensions and benefits. In other words they take care of people's everyday needs.

Local Soviets are elected for a term of two and a half years.

Functioning under local Soviets are street and house management committees, parents' committees, women's councils, councils dealing with cultural matters and other public organisations that unite millions of enthusiasts.

Local Soviets often conduct sessions outside their own premises. This is done to ensure maximum publicity.

At the elections to the present local Soviets 2,300,000 deputies were elected.

At each election the composition of local Soviets is substantially changed. For example, nearly half the deputies elected had not been deputies during the previous term. This means that new millions of working people are going through the school of state administration.

People's control. Bodies of people's control number over 1,300,000 teams and posts. They are set up at practically all industrial enterprises, offices, collective farms and other organisations. Their members are elected for a term of two and a half years at general meetings of all those employed there. At present some 9,500,000 industrial workers, collective farmers and office employees are members of people's control bodies. Their activity covers also government bodies.

People's controllers check up on the fulfilment of state plans, combat violations of state discipline, parochial tendencies and instances of excessive attention to departmental interests, bad management and squandering, lovers of red-tape and bureaucrats.

The people's control bodies make wide use of the press, radio and television.

The Communist Party of the Soviet Union

The Communist Party of the Soviet Union (CPSU), founded by Lenin, has a membership of 17.5 million. It is a union of like-minded persons; it unites on a voluntary basis the most conscientious members of society and is guided in its activity by the revolutionary theory of Marxism-Leninism.

The CPSU Rules say: "The Party exists for, and serves, the people. It is the highest form of socio-political organisation, and is the leading and guiding force of Soviet society."

Organisational principles. The basic principle of the Party's organisational structure and activity is democratic centralism. Without democracy it is impossible for Party members to express their opinions and without centralism it is impossible to achieve unity of action and to carry out Party decisions.

Democracy within the Party is ensured by the following principles: all leading Party bodies are elective; Party leadership is collective; the leading Party bodies are accountable to rank-and-file Party members; Party work is made public; all Party members enjoy equal rights and have equal responsibilities before the Party.

Centralism means discipline and unity. The decisions and directives of higher Party bodies are binding on the lower Party organisations; the minority must submit to the decision of the majority.

Under the Party Rules every Party member has the right to criticise and to express his opinion on any question. When a decision is adopted, however, it is binding on all Party members.

Party structure. The Communist Party of the Soviet Union is built on the territorial-and-production principle. Primary organisations are formed at the place of work of Communists and are united into Party organisations on the territorial principle.

The primary organisations, of which there are 414,000 at present, form the basis of the Party structure. Each Party collective having at least three Party members can function as an independent primary organisation.

The highest body of a primary organisation is the general meeting of its members.

All Party bodies—from the bureaus

Secretary of the Communist Party organisation in a shop at the Arsenal plant in Kiev talks with Komsomol activists

of primary organisations to the Central Committee of the Communist Party of the Soviet Union—are elected by secret ballot.

The highest body of the CPSU is the Party congress. It is convened at least once every five years. Between congresses, the Central Committee directs all Party activities.

The CPSU Central Committee elects a Political Bureau to direct Party activity in the interim between Central Committee plenary meetings, and a Secretariat to direct current Party work which consists chiefly of the selection of cadres and verification of the implementation of Party decisions. The Central Committee elects a General Secretary and sets up the Party Control Committee.

Party membership. The CPSU has been and remains a party of the working class: over 50 per cent of those now joining the Party are workers, and approximately 10 per cent are collective farmers. Over two-thirds of the Party's new members are young people under 23. (Admission to the Party is open to persons who have reached the age of 18). Altogether about 80 per cent of those joining the CPSU are people engaged in the sphere of material production. One out of every four or five intellectual workers is a Communist. Of all the Party members over 4 million, or almost one-quarter, are women. Rapid growth of the number of Party members among women is indicative of their active role in social life. One-third of primary Party organisations are headed by women.

Any citizen of the USSR on reaching the age of 18 is eligible for membership of the CPSU. But not everyone wishing to join the Communist Party can do so. Only the best people are admitted.

Before he is admitted to the Party each applicant works with a Party organisation as a candidate member for a term of one year. And this is not always the case. For example, in the five years from 1972 to 1976 100,000 candidate members were voted down after their term of candidacy had expired.

The leading force of Soviet society. The Communist Party does not assume the responsibility of direct state administration or take over the work of government or public organisations. On the contrary, its policy is aimed at developing the initiative of all government and public organisations, increasing their responsibility and competence, and at enhancing their role in the social and political life of the country, and in the political system of society.

The CPSU Rules grant primary organisations the right of control over the management.

The CPSU as the leading and guiding force of the entire life of the Soviet people, including intellectual and cultural, unites state and public organisations and work collectives in their efforts to maintain the spiritual and moral health of every member of society. The struggle is waged against everything alien to the interests of people. Social activity, creative thinking, respect for other nations, their culture, rights and freedoms are the qualities the Party strives to foster in Soviet people.

Unfortunately, in some people the mentality of a consumer society, money-grubbing and egotism is still strong. This centuries-old and tenacious outlook poisons people's minds and influences their behaviour, undermining and impoverishing their spiritual and moral life.

The CPSU Central Committee's resolution of 1979 "On the Further Improvement of the Ideological, Political and Educational Work" emphasised the necessity to combat any manifestation of such an outlook. The best antidote to manifestations of that kind are high ideals, cultural interests, a sense of internationalism, and the collectivist morality of the vast majority of Soviet citizens.

Public Organisations

Trade unions are the largest public organisation in the country. They unite 99 per cent of all workers and employees and the overwhelming majority of collective farmers. They are organised on the industrial principle: all employed at one enterprise belong to the same trade union irrespective of one's profession or trade. Altogether there are 30 trade unions in the country.

Trade unions not only concern themselves with protection of working people's material interests, but also take part in production management and in the administration of state affairs.

Not a single piece of legislation dealing with questions of labour, wage, or the working and living conditions of people is passed without the consent of trade unions.

Trade unions exercise control over the observance of labour legislation and safety measures, the work of enterprises, housing construction and the allotment of apartments; they handle questions of providing cultural and medical services for the people; they participate in drawing up national economic development plans, and administer the state social insurance system.

Each year trade union committees conclude collective agreements with the management of enterprises; these agreements provide for reciprocal commitments in the sphere of production, working and living conditions, wages, and upgrading workers' skills. Any official—from foreman to factory director— who violates labour legislation or fails to observe provisions of the collective agreement can be dismissed by the management on demand of the trade union committee.

Summing up the results of socialist emulation

In 1978, for example, 10,000 officials of different ranks were dismissed in response to such demands.

The opinion of the TU committee must be taken into account by the management when appointing an employee to a responsible post. The management has no right to fire a worker or an employee or to transfer him to another job without the consent of the trade union committee.

Thus every working person is guaranteed from unjustified and unlawful dismissal. Moreover, the TU committees exercising their rights sometimes manage to make the management take back to work even a person who deserved to be dismissed. Is it a paradox? No, just **the trade union's right of veto.** The TU committee may consent to dismissal only after checking the reasons produced by the management and being convinced that they are valid. If it finds them invalid the committee may refuse to approve the management's decision. Whenever the management dismisses an employee without trade union consent the court makes a decision on reinstating the dismissed person without even examining the cause of dismissal. And the person reinstated in his job receives his average wage for the period of forced unemployment. Instructions of the trade union technical inspectorate must be carried out by the management. Neither the ministry, nor a procurator or a court can annul them. Trade union committees may demand the closure of a shop or enterprise if it does not meet the safety requirements. This very thing happened at the Moscow "Gazosvet" factory which had been

Public organisations (membership in thousands)

Trade Unions 125,000

Young Communist League 39,000

Scientific and Technical Societies 8,000

Union of the Red Cross Societies 90,000

Union of Writers 8

Union of Artists 17

Union of Architects 14

Union of Cinematographists 6

Union of Composers 2

Union of Journalists 63

Society of Inventors and Innovators 10,000

producing light tubes for neon signs. Public inspectors noticed the leakage of noxious gases. The factory was reopened only after the leakage had been stopped; soon, however, at the trade union's request, the city authorities adopted a decision to transfer the factory beyond the boundaries of Moscow.

In another case, flour mill in Borisoglebsk was closed down following a trade union demand because there were cracks in the building's foundations. All mill workers were offered new jobs with the same wages at other city enterprises.

The officials responsible for such situations are punished by paying a fine, being dismissed or prosecuted.

Trade unions organise socialist emulation drives based on comradely competition between work collectives and between individuals in a given enterprise. They formulate the terms of emulation, sum up the results, decide on the size of incentives for the winners, and make public the results of the emulation drive which cover all aspects of the activity of work collectives.

Trade unions have their own sanatoriums, rest homes, preventive clinics, tourist centres, camping sites, holiday hotels, summer health camps for children and sports facilities. There are also 34 trade union sport societies with a membership of about 35 million.

The All-Union Leninist Young Communist League (YCL) is a mass organisation of young people between the ages of 14 and 28.

YCL represents the interests of the youth in government and public organisations. YCL representatives are members of the boards of ministries, of the State Committee for Physical Culture and Sport, the Presidium of the All-Union Central Council of Trade Unions and other organisations.

The All-Union Young Pioneers Organisation named after Lenin unites 25 million children between 10 and 15 years of age. The organisation has its own "symbols" among which are the red necktie and the badge.

The Soviet Women's Committee seeks to promote and strengthen friendly ties and mutual understanding between women in the USSR and other countries, and participates in the international democratic women's movement in defence of women's and children's rights. Over 500 young people from different countries study in the Soviet Union on scholarships granted by the Soviet Women's Committee.

The Committee of Youth Organisations of the USSR encourages young people to take an active part in

Young Pioneers on Moscow's Red Square

the struggle against imperialism, and for peace and social progress. The Committee co-operates with youth and student organisations in 130 countries. The Committee's Youth Travel Bureau *Sputnik* arranges tours for more than 150,000 foreign visitors every year and sponsors trips abroad for about as many Soviet young people.

The Union of Soviet Societies of Friendship and Cultural Relations with Foreign Countries incorporates tens of societies and associations and 28,000 collective members (staffs of enterprises and institutions, public and state organisations) throughout the country. The Union maintains contacts with the public and social organisations in 141 countries, including 115 national societies and organisations of friendship with the USSR.

The Soviet War Veterans' Committee, the Soviet Peace Committee, the Soviet Afro-Asian Solidarity Committee, the Soviet Committee for Solidarity with Chilean Democrats, and the Soviet Committee for European Security and Co-operation co-ordinate efforts of people in their struggle for peace and friendship among nations.

The Union of the Red Cross and Red Crescent Societies of the USSR helps medical institutions to carry out preventive measures against diseases, fight infectious diseases and protect the environment, and organises the blood donor movement throughout the country. It also provides medical assistance, food and other forms of aid for people of countries that have suffered from natural calamities, wars and epidemics, assists Soviet citizens and people in other countries in the search for lost relatives, and helps the developing countries to build hospitals and clinics, and train national medical personnel.

In each Union Republic there are **societies for nature conservation and protection of historical and cultural monuments, book lovers' and theatrical societies, societies of hunters and of fishermen, philatelists' and sports societies** and many others whose membership runs into millions.

LATVIAN SOVIET SOCIALIST REPUBLIC

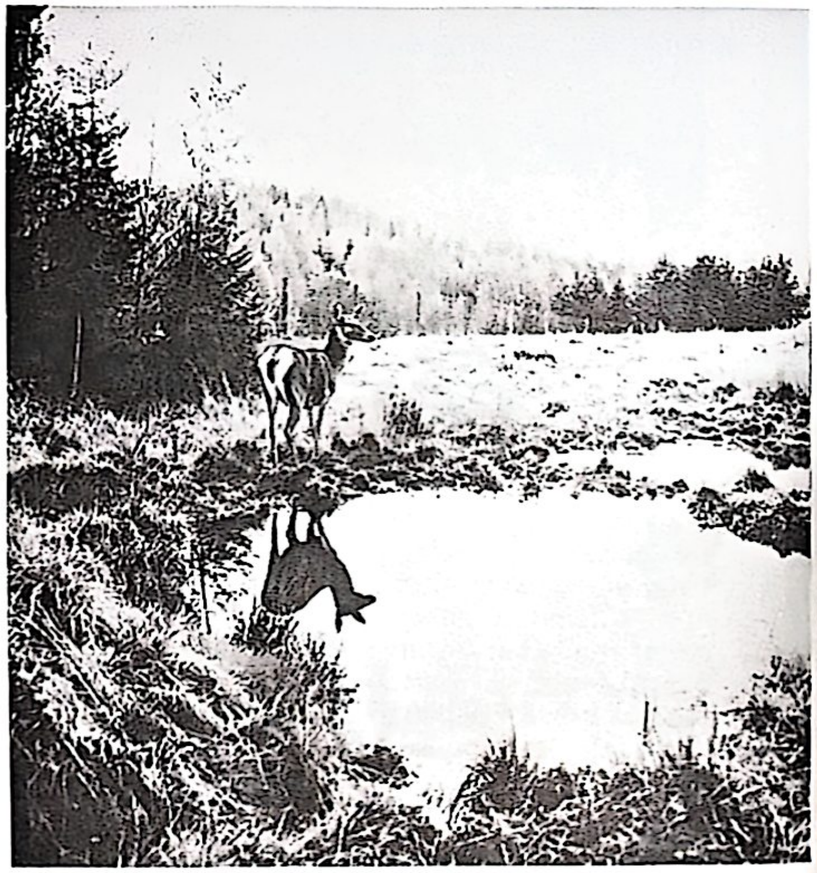
Area—63,700 sq. km
Population—2,500,000
Capital—Riga
(population 835.000)

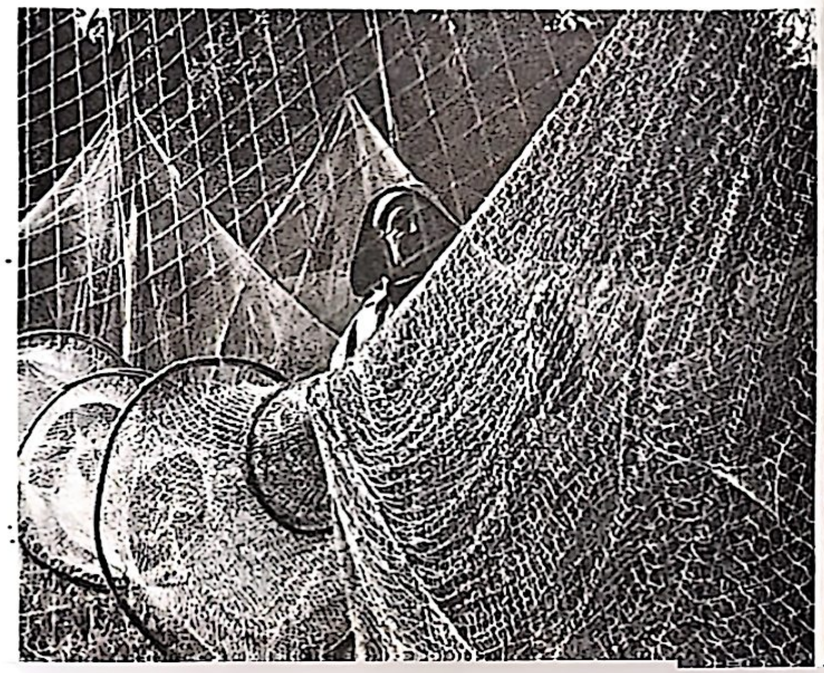
For ages the sea had provided the Latvians with food. This is also true today. Along the republic's 500-kilometre-long coastline there are 11 collective fishing farms, Riga, Ventspils and Liepaja have modern fishing ports. From here huge modern refrigerator vessels and mobile fish-processing plants set out for different parts of the world ocean.

Latvia has no major fuel resources with the exception of peat and wood. However, the republic has advanced high-energy industries producing top-quality radio sets and radiograms, minibuses, compressors, railway coaches and diesels.

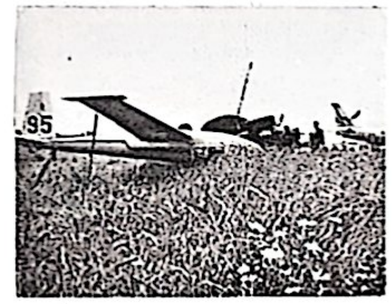
Technology has become a part of the people's everyday life. An automatic line with an electronic computer operates in the canteen of the Riga VEF plant which saves the workers' time and serves them with tasty meals on credit—the lunch bills are automatically dispatched to the accounts department. Members of the Nakotne Collective Farm decided that instead of having their personal incomes increased still more they would be better off by building up a flying club and bought two planes for it.

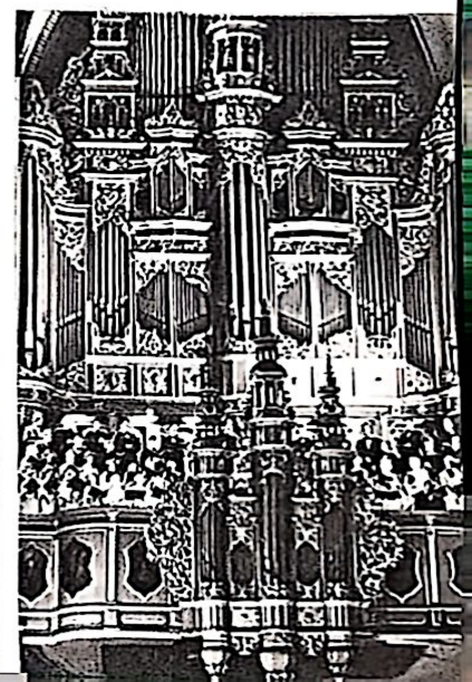
The Latvian Academy of Sciences is housed in a 22-storey building in Riga. It has an atomic reactor, botanical gardens, a radio and astrophysical observatory and a publishing house that puts out four scientific journals. Latvian scientists have given a satisfactory explanation of why the Gulf Stream preserves its warmth in the northern waters, discovered two new planets between Mars and Jupiter which they named Riga and Latvia, proved that one cubic metre of wood is capable of yielding 1,500 metres of silk, developed a low-toxic drug "fluorafur" for the treatment of tumour and other medicines (the United States, Japan, West Germany, France, Britain and Italy have acquired licenses and patents for them), put forward an original hypothesis explaining the Earth's rotation, and collected three million national songs, tales, legends, proverbs, riddles and jokes which convey a "flavour" of bygone times.





Latvian landscape. Young construction workers. An old fisherman. Anglers' base in Jurmala. Airfield of the flying club at the Nakotne collective farm. Products of Latvian motor workers. Organ in the Domas Cathedral in Riga.





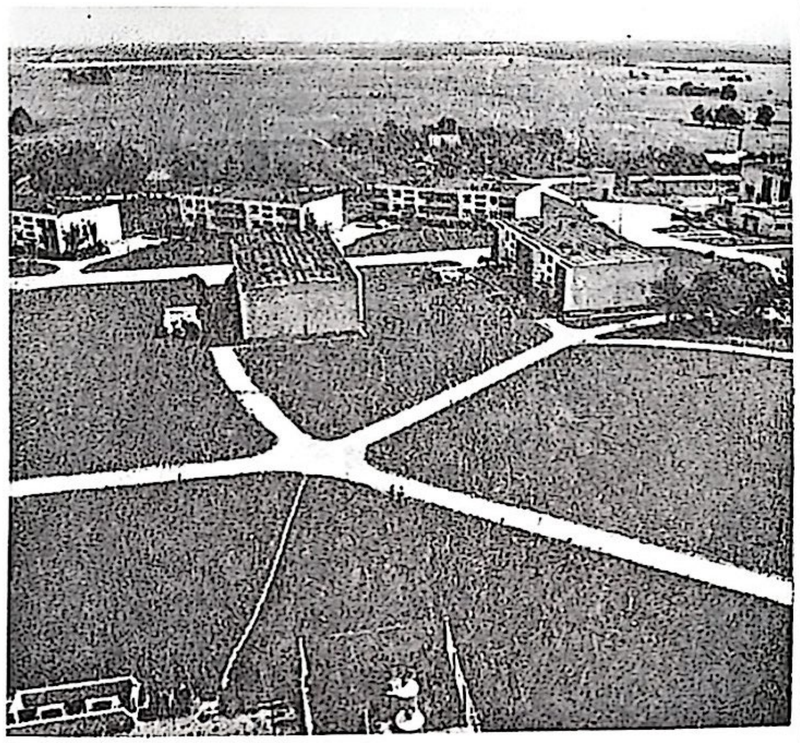
Area—65,200 sq. km
Population — 3.400.000
Capital—Vilnius
(population 481,000)

Milk, meat and butter output per capita in Lithuania is considerably higher than the average for the USSR as a whole, and this despite the fact that in the last forty years its rural population has decreased by 60 per cent. The explanation for this lies in mechanisation of manual work with machines being provided by the state. Land improvement is another factor in the development of agriculture.

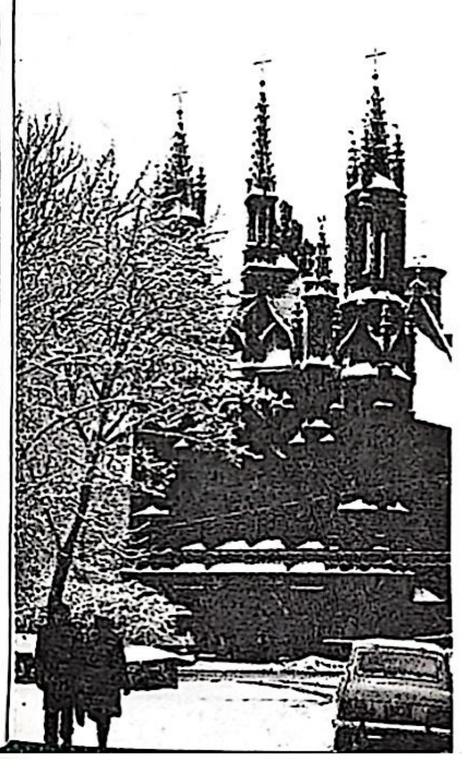
In the environs of Panevezys, in the very heart of Lithuania, there stands a granite monument. It depicts a rock through which a flower has miraculously broken forth and opened its petals. Such a miracle has been worked by Lithuanian reclamation specialists who have made the most rocky and swampy lands yield fruits. People no longer exclaim in anguish: "The boulders never cease growing!" Vaclovas Intas, a rural doctor, has collected in the Mosedis village 5,000 boulders which had only recently littered the wastelands that have now been turned into orchards. Collective farmers have used the collection of boulders to set up a museum park.

Some 200,000 farmers have moved from their individual farmsteads to urban-type settlements built on reclaimed lands. The settlements are noted for their distinctive architectural style, which can be said of Lithuanian cities in general. There the new buildings are in harmony with old architectural ensembles among which are the republic's 630 Roman Catholic, Lutheran and Russian Orthodox churches and synagogues.

In the tower of the Historical Museum in Kaunas there are 35 bells. These are not church bells, they were assembled into a single musical instrument by the 79-year-old composer Viktorás Kuprias-vičius. In accordance with tradition, twice a year—on New Year's night and on the 25th of May when the Spring poetry festival is held—he climbs the tower and gives remarkable bell concerts. Throughout the surrounding countryside the bells chime the melodies of Verdi, Tchaikovsky, Mozart, Grieg and other classics.



A state farm. Young musicians. Collective-farm herd. Reclaimed land. St. Anne's Church, Vilnius. At an art school. Trakai Castle.



ESTONIAN SOVIET SOCIALIST REPUBLIC

Area—45,100 sq. km
Population—1,500,000
Capital—Tallinn
(population 430,000)

Apart from the mainland, the territory of Estonia includes nearly 800 islands dotted along its coast. The republic is known for its dense forests, crystal-clear lakes, sandy beaches and its capital city that has preserved its medieval beauty.

Estonia is rich in shale which is the primary raw material for antiseptics, petrol, glue, varnishes, chemical weed and pest killers, gas and many other products; gas from Estonia is piped to Leningrad. The country that forty years ago was contemptuously called a "potato republic on Europe's outskirts" now has well-developed engineering and instrument-making industries.

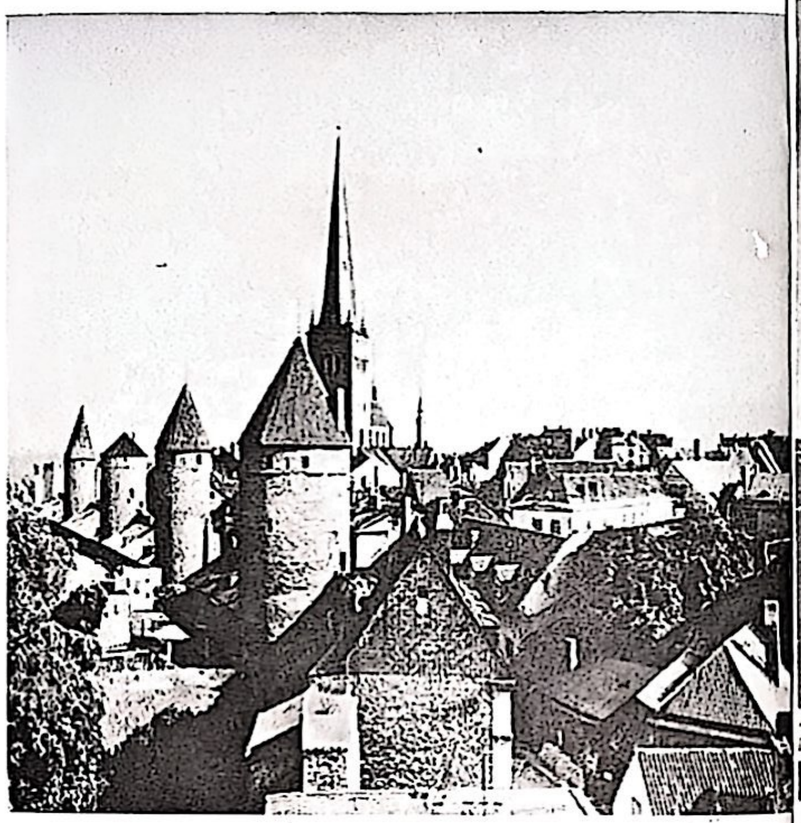
In Estonia the average earnings of farmers specialising in dairy farming and pig breeding are well above the workers' wages although in the rest of the country the reverse is true. The reason lies in the high productivity of Estonia's agriculture.

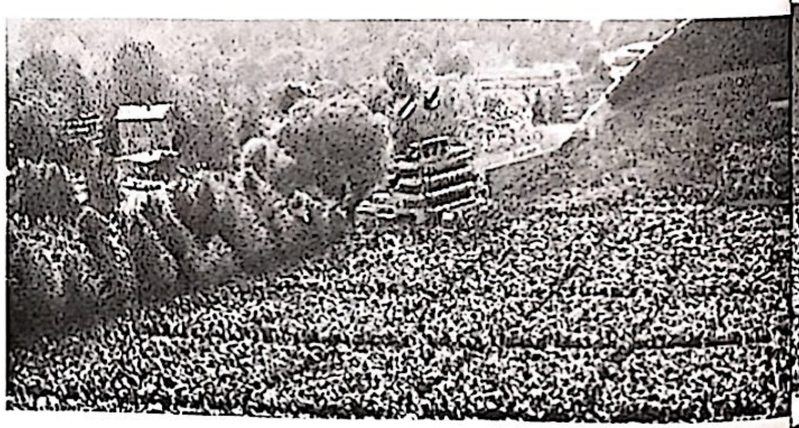
Estonia has over 350 churches the majority of which are Lutheran and Russian Orthodox churches. Society's attitude toward believers is the same as toward non-believers. People are respected above all for their labour achievements. One of the best textile workers of the Manufaktura Kreenholm mills, a Baptist, has been elected to the USSR Supreme Soviet, and Archbishop Hark and Metropolitan Aleksi have been awarded orders for their work for peace and social progress.

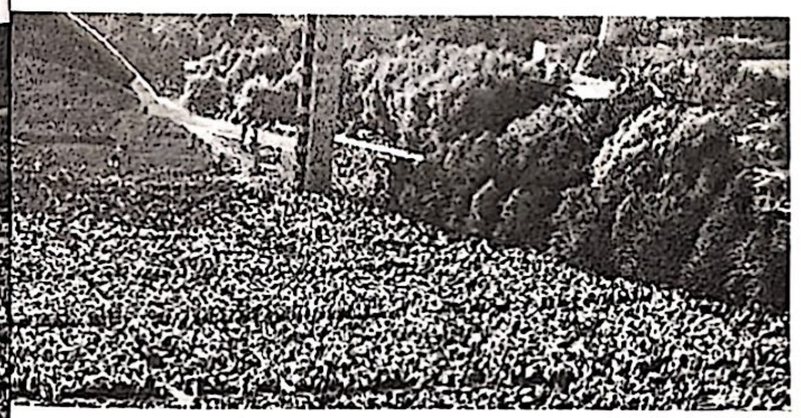
For more than a century now every five years Estonians flock to their capital for the traditional song festivals during which a choir of 30,000 performs to an audience of 200,000 from a stage erected on the slope of Mt. Lasnamäe. The choir is conducted by the composer Gustav Ernesaks, the founder and leader of Estonia's State Academic Male Choir, who is well known for his interpretations of requiems by Verdi, Mozart and Cherubini and oratorios by Bach.

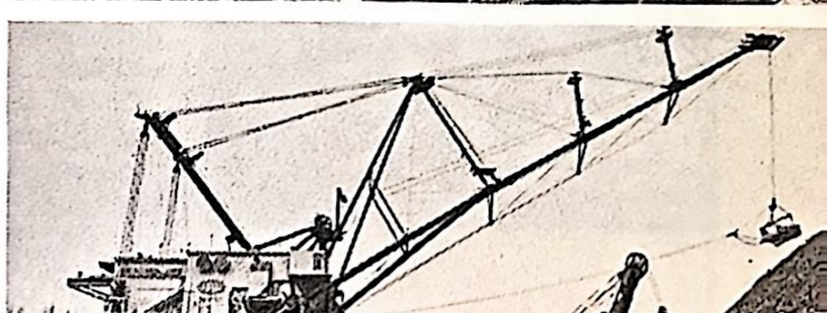
The well-proportioned, sturdy, fair-haired Estonians are excellent sportsmen and have distinguished themselves in the traditional Estonian sports: sailing and motorcycle and auto racing.

Old Tallinn. Here semiconductors are made. Children's dance contest. Song festival. Tallinn Regatta. Future workers. At a state farm livestock fattening centre. Mining shale.









Law and Order

Justice in the USSR is administered exclusively by the courts. All courts—from people's court to the Supreme court—are elective. In accordance with the Constitution judges and people's assessors are independent and subject only to the law. In considering a case a judge is guided by the law, by his own opinion and by the evidence of the case as established by the court.

No one may be adjudged guilty of a crime and subjected to punishment as a criminal except by sentence of a court and in conformity with the law. A defendant is considered innocent and cannot be convicted until proved guilty. A defendant is given the benefit of the doubt. All citizens are equal before the law and the court.

Proceedings in all courts are open to the public. Hearings in camera are only allowed in cases where state secrets are involved or in order not to divulge information concerning the private life of the persons participating in court proceedings. A defendant has the right to the services of a lawyer.

The aim of the court in meting out penalties is not only to punish the criminal but also to reform him—this is the explanation of the fact that the number of convicted persons has continuously been on a decrease, and organised crime has been virtually eradicated.

The broad public take an active part in not only preventing anti-social acts but also determining the degree of responsibility of those who commit such acts. Judicial bodies frequently pass cases of minor offence over to comrades' courts elected at places of work or residence.

During the hearing of a criminal case the court takes into consideration the work collective's opinion of the defendant. By a joint decision taken at a meeting, factory or office workers may ask the court to sentence the offender to a penalty without imprisonment. If the court complies with this request the work collective assumes responsibility for the lawbreaker and helps him to reform.

Approximately 85 per cent of all cases are civil cases dealing with the application of labour legislation, with legislation on marriage and the family, housing and other sectors of civil legislation.

The judicial system. Judges are elected for a term of five years. People's judges are elected by the citizens on the basis of universal, direct and equal suffrage by secret ballot and higher courts by the corresponding Soviets. Candidates for the posts of people's judges are nominated by collectives of working people. Any lawyer who has reached the age of 25 may become a people's judge.

People's judges are required to make regular reports at working people's meetings on their work and on the functioning of the court. If a judge misuses his authority and does not perform his duties, or if his conduct is unworthy of a judge, he may be recalled and new elections are held.

In all courts cases are heard by a collegium consisting of a judge and two people's assessors who have the same rights as the judge.

Court in session

Decisions are taken by a majority vote. If the opinion of the people's assessors differs from that of the judge, the court takes the decision voted for by the people's assessors. People's assessors are elected for a term of two and a half years at meetings of citizens at their places of work or residence. There are 694,000 people's assessors in the country. They perform their duties once a year for a period of two weeks.

People's courts form the backbone of the Soviet judicial system. They examine over 95 per cent of all civil and criminal cases.

The Supreme Court of the USSR is the highest judicial body in the country. The Chairmen of the Supreme Courts of Union Republics are *ex officio* members of the Supreme Court of the USSR which examines, as a court of first instance, cases of exceptional importance. Its plenary session is the highest judicial instance. The plenary sessions are attended by the Procurator-General of the USSR and the Minister of Justice of the USSR. The chief task of the plenary session is to sum up judicial practice and see to the correct interpretation of laws by the courts.

Types of punishment for criminal offences include public censure, fines, deprivation of the right to hold certain posts or to engage in certain activities, exile, banishment, corrective labour without imprisonment, and imprisonment. There are two further types of punishment which are meted out as additional ones—deprivation of a title of honour or of a military rank, and confiscation of property.

Upon considering the actual circumstances of the case and the personal character of the defendant, judges may decide to put him on probation. In this case the court, while sentencing him to imprisonment or corrective labour, takes the following decision: if the convicted person during the term of probation (from one to five years) does not deliberately commit a new crime, the sentence will not be put into effect. During the entire term, the person on probation is regarded as a convicted person, which entails a certain restriction of his rights. If he commits a fresh deliberate crime punishable by imprisonment, his probation is revoked and the court adds to his sentence for the new crime the full term or a portion of the term of punishment prescribed for his previous crime.

The maximum term of imprisonment is 15 years. Prison terms exceeding ten years are given for particularly grave offences and are imposed in the case of especially dangerous criminals.

Soviet law provides for the possibility of release on parole.

Convicts perform useful work at their places of detention, for which they are paid according to the rates accepted all over the country. They can learn several trades or receive a general education there.

The law envisages capital punishment for persons who have committed an exceptionally heinous crime, such as taking life or encroaching upon the foundations of the socialist system.

The militia. This is a body of state authority concerned with the maintenance of public safety and order. It protects the personal safety of citizens, and state, public and personal property and it sees that traffic rules are observed.

Volunteer public order squads. These are the most widespread form of the mass participation of citizens in maintaining public order. They are set up on a voluntary basis by the work collectives. Once a month each member of a public order squad spends a few hours of his free time patrolling public places.

The volunteers are mainly concerned with preventing the violation of public order. However, the law provides for penalties for criminal acts against them that are as severe as those for offences against representatives of bodies of state authority.

Rights and Duties of Citizens

Soviet legislation and legal practice from the very beginning essentially anticipated what was proclaimed by the Universal Declaration of Human Rights, adopted by the UN 30-odd years ago. The principles which had long been realities in the Soviet Union were later expressed in the provisions of the International Covenant on Economic, Social and Cultural Rights and in the International Covenant on Civil and Political Rights. The Soviet Union was one of the first states to ratify these documents.

Soviet law does not restrict citizens' rights on grounds of sex, nationality, race, social and property status, their past activity, place of residence, religion, and so on. All citizens have equal rights and equal duties in keeping with the law. Moreover, the state provides the necessary conditions and facilities for the exercise of these rights.

The right to work is the basis of the freedom of the individual. In the Soviet Union unemployment was done away with in 1930 and ever since then the demand for labour has been greater than the supply. All citizens are given jobs according to their education, professional training, abilities and inclinations.

As for women the Constitution of the USSR grants them equal rights with men to work. Equality in law, however, does not and in this case cannot mean absolute equality in everyday life, because women are physically weaker than men. For this reason out of 1,400 major occupations in the USSR only 940 are open to women. The remaining involve hard physical labour, working conditions injurious to health, or night work and are prohibited to women by law. This is affirmed in the Constitution.

The right to rest and leisure. Most industrial and office workers enjoy two days off—Saturday and Sunday. Workers engaged in arduous or harmful jobs are entitled to longer leave—up to 50 working days.

Today there are more than 14,000 sanatoriums, rest homes, holiday hotels and tourist hotels and camps in the Soviet Union, which cater for more than 50 million people every year.

The right to health protection. See "Public Health" (page 134).

The right to social security. See "Social Security" (page 161).

The right to education. See "Education" (page 117).

Freedom of scientific, technical, and artistic work is ensured by the government promotion of scientific and technical research and the development of all forms and genres of art. Writers, artists and theatre and film directors are completely free in their work. There are no forbidden themes, nor forbidden forms. The freedom to create, however, is incompatible with encroachments on the vital interests of society and people. Soviet society does not tolerate the propaganda of war or of racial and religious strife, pornography or writings permeated with an anti-humanist, anti-socialist spirit.

Freedom of speech. Every citizen has the right to express his or her opinion on any state or public matter. One of the main tasks of the press, radio and television is to organise discussions on problems of current interest, to find out what people think about important social problems and to call attention to shortcomings in any area of political and economic activities. The persons criticised, whatever their title or rank, are obliged to inform the mass media, or organisations which criticised their work about the measures taken to eradicate the shortcomings.

Freedom of conscience. See "Religion" (page 76).

Equality irrespective of nationality and race. The law imposes severe punishment (imprisonment up to three years) on persons fomenting racial or national animosity and discord, and on persons seeking to curtail the rights of or to extend special privileges to citizens on the grounds of race or nationality.

The right to choose one's place of residence. Citizens are free to choose where to live and are free to change their place of residence within the USSR. Every year approximately ten million people in the Soviet Union change their place of residence.

The rules of emigration for Soviet citizens fully accord with the International Covenant on Civil and Political Rights. Any restrictions imposed are in keeping with the provisions of the Covenant; they involve cases where national security, health, morals or the rights and freedoms of other citizens are involved.

The right to own and inherit personal property is protected by law. Every Soviet citizen may own property intended for the satisfaction of his personal needs. A citizen may leave all or part of his property in his will to any persons, whether they are his legal heirs or not. The law, however, protects the rights of heirs who are disabled or under age. Such heirs, irrespective of any will, are entitled to a share of the property.

The right to protection by the courts. Any citizen has the right to sue in court for the retraction of statements published or circulated about him or her which are defamatory to their honour and dignity. Where such statements are published in the press, they must be retracted in the same organ of the press. If the court ruling is ignored, the editor will be fined and this does not release him from the obligation to carry out the court's decision. All the expenses incurred are paid by the person who is guilty of libel. The law makes slander and insult, that is, the deliberate spreading of untrue information about others, a criminal offence.

Any citizen has the right to compensation for damage resulting from unlawful actions. Every citizen has the right to apply for the defence of his honour and dignity to state bodies and the press. Respect for the individual and protection of the rights and freedoms of citizens are the duty of all state bodies, public organisations and officials.

Special attention is paid by the state to guaranteeing the freedom of the individual. Citizens of the USSR are guaranteed inviolability of the person. No citizen may be arrested except by decision of a court or with the sanction of the prosecutor. For this reason unwarranted arrest or illegal detention resulting from erroneous actions of investigators, judges or other officials is considered crimes against justice.

Duties. Citizens' exercise of their rights and freedoms is inseparable from the performance of their duties and obligations, and above all the observance of the Constitution of the USSR and of Soviet laws, as well as compliance with the standards of socialist conduct. It is the duty of citizens to concern themselves with the upbringing of children, to care for their parents, to protect socialist property, to work conscientiously, to defend their motherland, to respect the rights and lawful interests of other persons and to protect the environment.

The citizens' duties, which all share alike, are determined by the interests of society, the aim in view being to ensure conditions in which everybody may exercise their rights and freedoms. The exercise by citizens of their rights and freedoms must not, however, be to the detriment of other citizens, of society and state. For instance, the law forbids the exercise of the freedom of speech for purposes of defamation and slander and for carrying out anti-Soviet agitation, propaganda of war, of racial and national exclusiveness, and so on. Such actions are punishable by law.

Religion

The Constitution of the USSR guarantees every citizen the right to profess any religion or none at all, to perform religious rites or to conduct atheistic propaganda.

The state protects the rights of believers of all religions without exception. The incitement of hostility or hatred on religious grounds is prohibited by law. Any attempt to interfere with the lawful performance of religious rites is considered an indictable offence.

Refusing to give a citizen a job or to admit him to school or college, as well as dismissing or expelling him because he happens to be a believer is likewise punishable by law. Parents or legitimate guardians are not restricted in their freedom to bring up their children in accordance with their convictions. At the same time Soviet law forbids beatings or the infliction of mental suffering for the purpose of inculcating religious faith in children.

In civic life a person's attitude to religion is his exclusive private affair. No official form or paper, be it passport, questionnaire or census sheet, requires the signatory to state his or her religious belief. Believers of all faiths enjoy equal rights and opportunities. The Soviet state forbids only such religious groups which, under the guise of faith, disturb the peace, encroach upon the individual and his civic rights, impair his health through cruel rites, or cause their followers to disobey laws or to refuse to discharge their civic or public duties.

Religious associations publish their own journals and magazines and also sermons, theological works, calendars, prayer books and hymn books; they republish the Gospel, the Bible, the Koran and their interpretation, and other religious books—a total of 50 different publications.

The church is separated from the state. Liaison between the state and religious associations is effected by the Council for Religious Affairs under the Council of Ministers of the USSR. Its principal function is to supervise the enforcement of legislation on the status of religious organisations, but not control of their activities. The state does not interfere in the internal affairs of the church. The funds of the church, consisting of the voluntary donations of believers, are not subject to taxation.

The Russian Orthodox Church is the largest religious denomination in the USSR. Its supreme power is vested in the Local Council which elects the Holy Patriarch of Moscow and All Russia. In 1971 Pimen, Metropolitan of Krutitsa and Kolomna, was elected to this high office. The Holy Synod functions under the Patriarchate. The Russian Orthodox Church is divided into dioceses. There are dioceses of the Russian Orthodox Church in the United States, France, Austria, Israel and several other countries.

The Russian Orthodox Church maintains three theological seminaries and two theological academies where its clergy are trained. Altogether 1,600 students attend theological schools of the Russian Orthodox Church. In the course of eight years the students study the Bible, church dogmas, theology, the history of the early undivided church, Byzantine history, the history of the Russian and Slavonic churches and of other faiths, the Russian and foreign languages,

Service in a Russian Orthodox Church

Muslims at prayer

church singing, the history of the Soviet state, and the Constitution of the USSR. The seminarians study liturgy in churches attached to these theological schools. They also attend various study circles, in particular one where they are taught to conduct church choirs. Upon graduation the students may continue their studies and defend master's and doctor's theses at the seminaries or academies.

The Georgian Orthodox Church is headed by the Patriarch-Catholicos of All Georgia, Ilia II.

The Armenian Gregorian Church headed by the Patriarch-Catholicos of All Armenians, Vazgen I, is one of the oldest Christian churches, while Armenia is the first country where Christianity became the state religion (in the year 301).

The Muslims largely belong to the Sunnite denomination of Islam, but there are many Shiites, too. They regularly meet at conventions and conferences and go on pilgrimages to Mecca. There are four independent Muslim Boards: in Tashkent, Ufa, Makhachkala and Baku. The Koran of Caliph Othman, the sacred book written by the first generations of Muslims, is kept in the mosque of Tashkent. All theological and dogmatic questions are discussed by the Council of ulemas, i.e. elders and theologians. Numerous *fatwas* elaborated by the Council are made known to Muslims both at mosques and through the journal *Muslims of the Soviet East*.

. . . Early in the morning, at the hour when, the Koran says, one cannot distinguish a white thread from the black one, muezzin Odambek Ergashev proclaims the hour of prayers from the minaret of the mosque in the Soldatsky township, a district centre in Uzbekistan. The faithful gather in the Yangi-Makhallya mosque, Imam Tukurullo Khadzhiev preaches a sermon. He calls on the Muslims to be faithful to the teachings of the Koran and Sunna "left to us by Prophet Mohammed, may Allah bless and keep him", and by their work to contribute to the prosperity of the Soviet state in which all people are equal.

The imam is 58 years old. He grew up in a religious family and got his education in the Mir-Arab Madrasah in Bukhara.

The mosque is administered by an executive body of three members

Sermon in a synagogue

called mutawallis. This body is elected by the congregation from among their most respected members.

All clergymen regardless of their position (muezzin, naib-imam, imam, imam-khatib, haji or mufti) receive a fixed salary. Those who serve in the mosque receive a salary from the Muslim congregation. Clergymen of advanced years receive pensions.

Donations from the faithful are also used for training clergymen in a madrasah or an academy, for publishing religious literature, maintaining international contacts and restoring monuments of Islamic architecture.

Muslim priests are trained in the Mir-Arab Madrasah in Bukhara and the Imam al-Bukhari Higher Theological School in Tashkent. To retain the respect of his congregation, the imam-khatib has to be a knowledgeable person and one who increases his knowledge continually. Therefore the curriculum of theological schools includes such subjects as the fundamentals of philosophy, geography, the history of the Ancient East, and the Russian, English, Persian and other languages.

An international conference of Muslim religious leaders was held in Tashkent in 1980 to mark the advent of the 15th century A.H.

The Roman Catholic Church has most of its followers in the Western part of the country. It has a vicariate and seven dioceses but no one central religious body.

The Evangelical Lutheran Church has its followers mostly in Estonia and Latvia. Its congregations are governed in Estonia by a consistory and in Latvia by a Supreme Church Council. . . . A prayer meeting of the **Evangelical Christians-Baptists** in Kiev is under way. It is the rite of the Lord's Supper. The ordained presbyters headed by Nikolai Velichko break a loaf of bread into small parts and pour out wine into cups. The believers receive communion.

The rite is conducted on every first Sunday of the month. On this day the majority of the congregation are present at the prayer meeting. The congregation numbers 600 people.

Nikolai Velichko, 42, is a senior engineer at a factory producing medical equipment. He has three children of school age. The eldest daughter is 17. They all attend prayer meetings, together with their parents. Soviet Baptists have 5,000 churches.

Judaism is practiced in areas with a Jewish population. There are nearly a hundred synagogues in many towns and cities, each functioning independently. The choral synagogue in Moscow publishes the Pentateuch and other literature in addition to the religious material imported from abroad.

Buddhists live in regions and republics situated in the East of the USSR.

The Reformed Church functions in the Transcarpathian region of the Ukraine and the **Methodist Church**, headed by a superintendent, has its congregation in Estonia.

There are also very small groups of other faiths.

Religion as a school subject is not taught at general schools. Each Church has educational institutions to train its clergy. Theological schools send their students for further study to the divinity schools at Oxford and Cambridge, to San Casimiro University in Rome, the Anglican College of the Resurrection at Merfield, Great Britain, the University of Göttingen in the Federal Republic of Germany and other religious centres.

More than 20,000 Russian Orthodox and Roman Catholic churches, synagogues, Lutheran churches, Old Believers' churches, mosques, Buddhist monasteries, prayer houses of Evangelical Christians-Baptists, Seventh Day Adventists, etc. and 18 Orthodox monasteries and nunneries are functioning in the USSR.

Marriage and the Family

The number of families in the USSR is growing. There were 58,700,000 in 1970 but in 1979 the number had risen to 66,300,000. Incidentally, the number of families is increasing faster than overall population growth. In the meantime the family has ceased to be as large and stable as in the days of our grandfathers. Whereas in rural areas such as those, for instance, in Kirghizia, there are only two divorces for every 100 marriages, in such cities as Kiev, Riga and Odessa every other marriage ends in divorce. Why? Because of conflict within the family. The primary and most frequent cause of conflict is the discrepancy between the high standing of women in society and their position in the family.

Indeed, both sexes enjoy virtual equality in public life. Women today are quite on a par with men in the level of their education. A quarter of the workers in the health service and one-third of those in education are women. Nor do they lag behind in science. Moreover, scientific and technological progress has opened to them the way to what were traditionally male professions. Although the fair sex is now financially independent, it has not yet attained full equality in the family.

From olden times when the husband was the sole breadwinner and the wife was supposed to keep house the woman has borne the brunt of domestic chores. As often as not the husband, coming home from work, relaxes with a newspaper or watches television while the wife has to attend to the children, cook meals and tidy up the flat. Every day women spend a lot of time on housekeeping and this puts them in an unequal position in relation to men.

It is very hard to bear the double burden of a job and housekeeping. But women do not wish to stop working. Not only because of the money they earn. They refuse to confine themselves to a sit-at-home life. They want to mix with other people, do well in their job and feel useful to society.

Women's striving for complete equality in family life makes them unwilling to tolerate unfair distribution of rights and duties in the family. What used to be the norm in family relations is becoming a cause of conflict and even divorce. As often as not it is wives who now initiate divorce proceedings. The independent and educated woman with a wide range of interests no longer wants to put up with patriarchal family ways and she is less willing to forgive the husband a lack of attention to herself.

The overload the married woman has to bear also affects the size of the family because every new child means more chores for the mother. It means she will have much less time than her husband for leisure and, consequently, for cultural and professional advancement. Many see the way out in having fewer children and, as a result, the birth rate shows a tendency to decline. To maintain the size of the population every family should have at least three children and, of course, not one or two, as has become customary in Moscow, for example. There are also many incomplete families in which single mothers rear their children, as well as childless

single people—they constitute 6 per cent of the population.

It would be wrong to say that the changed status of women in socialist society and the increasing demands they make of married life have not affected the way of life of many families. The spouses are coming to share housework more and more equally. This is particularly true of young families or those where husband and wife have common cultural and professional interests. Sociological surveys have revealed that sharing domestic chores equally has become the established practice in one-third of all young families.

The state takes various steps to aid and support the family, first of all, to relieve mothers of as much of the burden of child care as possible. To this end more and more nurseries and kindergartens are being opened and more and more extended-day groups are being established at schools where children can rest, have meals and do their homework under the supervision of teachers until their parents return from work. In addition, a variety of social experiments are being conducted now. For instance, some factories in Moscow, Riga, Odessa and Kaluga have introduced shorter working days for mothers with small children—they work one or two hours less. Tests are also being made to see whether it would be expedient to enable women to start and end their working day at different times. Wherever the conditions of production permit it the mothers of small children are enabled to do work at home.

In many cities public services are being brought closer to the places of work. They have opened branch offices at big factories where you can receive several dozen services, from dry cleaning and laundering to house repairs. The same is true of the food shops: you can order all you need before starting work and collect the parcels after working hours so as not to waste time going round the shops.

Every aspect of family service is expanding and assuming new forms, ranging from statistics, medical lectures and marriage counselling to higher benefits and grants for large families, and the expansion of the network of kindergartens, schools, laundries and canteens. Doctors and scientists advise on preserving and strengthening the family, on the psychology of family relations and sexual life. Their advice is particularly important to those who are about to start divorce proceedings.

The open health-building university in Moscow which has 2,500 regular students, has two departments for newly-weds and young parents among other sections.

Many cities have set up acquaintance clubs for those over 30 who did not find personal happiness and who may need to be helped expand their social contacts and find a companion in life.

Foreign Policy

The world situation became noticeably aggravated early in 1980. In a bid to achieve military superiority over the Soviet Union and the other socialst countries Washington secured the consent of the leading circles in the NATO military bloc for the additional deployment of nearly 600 new American nuclear missiles in Western Europe. In the meantime the US Administration did all it could to freeze Soviet-American relations and talks on disarmament, which in the '70s had been developing favourably. American diplomacy went out of its way to isolate the USSR on the world scene using the events in Afghanistan as a pretext. Talk about another cold war began. . .

The Soviet Union could have taken the same unfriendly steps, to put it mildly, in response to American policy. However, the USSR rejected confrontation in order not to bury the fruits of detente which had been obtained with so much effort. In that period of tension Soviet diplomacy was calm, explaining to the world that the USSR had given assistance to the Afghan people at the request of their legitimate government. The move had been made without aggressive intentions and with the exclusive aim of protecting the sovereignty of Afghanistan from the world reactionary forces which, with the aid of armed gangs sent from Pakistan, had tried to crush the Afghan Revolution. It was emphasised that the events in Afghanistan had in no way affected the interests of any third country and that the limited Soviet troop contingent would return home as soon as the factors that caused the Afghan government to appeal for help ceased to exist.

For this it is necessary to have reliable guarantees that the sending of counter-revolutionary bands to Afghanistan will be stopped.

In the meantime Western Europe displayed common sense in refusing to follow the appeals from across the ocean to ostracise the USSR. On the contrary, it urged the continuation of East-West dialogue. This viewpoint was reaffirmed shortly after during the Soviet-French and Soviet-West German summits. Despite US demands for economic sanctions against the USSR its trade turnover with France, Italy, Britain, Federal Germany, and other West European countries in 1980 considerably exceeded the figures of the previous year.

The Soviet Union continued its peace initiatives. These were unanimously supported by the leaders of the socialist countries who met Leonid Brezhnev in the Crimea in the summer. From the rostrum of the 35th session of the UN General Assembly the Soviet delegates called on the leading powers to reduce armed forces, to put an end to the setting up of new military political groupings, and to conclude the Treaty on General and Complete Ban on Nuclear Weapon Tests.

The Soviet forces and military equipment deployed in the German Democratic Republic were reduced, although the confronting NATO armies were far from scaled down. In the course of the year leaders of Syria, Afghanistan, Ethiopia, Finland, India, Mozambique, and other countries were invited to the Soviet Union for talks which were of a purely peaceful nature.

A year marked by active Soviet diplomacy was crowned by Leonid Brezhnev's official visit to India. The leaders of the two countries observed that their talks in the current complex world situation could and should reduce tension at least in Asia and, in particular, in the Persian Gulf region, where a tragic and senseless conflict had flared up between Iraq and Iran. In his speech to the Indian Parliament Leonid Brezhnev proposed concrete measures to ease tension in the Persian Gulf area.

To the Parliaments and Peoples of the World

AN APPEAL BY THE USSR SUPREME SOVIET

Concerned by the growth of the military danger and by the unprecedented scale of the arms race, the Supreme Soviet of the Union of Soviet Socialist Republics appeals to the Parliaments and peoples of the world.

The Supreme Soviet of the USSR is making this Appeal on the 40th anniversary of the day nazi fascism attacked our homeland. Soviet people bow their heads to the illustrious memory of 20 million fellow-countrymen who fell in the war. The Second World War brought incalculable hardship and suffering to all mankind. We deeply revere the memory of all who gave their lives in the struggle against aggression, for peace on earth.

History taught a stern lesson. The peoples paid a very dear price for their failure to prevent war, to avert in time the threat which hung over the world. We must not allow any repetition of the tragedy. Everything must and can be done to prevent another world war.

Our planet is in any case already oversaturated with weapons of mass destruction. But their stockpiling continues, ever more sophisticated and destructive weapons are being developed. Launching pads are being prepared in Western Europe for hundreds of new nuclear missiles. Attempts are being made to condition people to the criminal idea of the permissibility of using nuclear weapons.

Political tension is being deliberately stepped up. Once again there is a calculated drive to achieve military superiority; threatening language is being used. The right to intervene in the affairs of other countries and peoples is being openly claimed. And all this under the cover of a gross lie about a "Soviet military threat".

The USSR Supreme Soviet solemnly declares that the Soviet Union is not threatening anyone, it does not seek confrontation with any state in the West or in the East. The Soviet Union has not been and is not striving for military superiority. It has not and will not initiate new spirals in the arms race. There is no type of weapon it would not agree to limit or to ban on a mutual basis by agreement with other states.

The safeguarding of peace has been, is and remains the supreme aim of the foreign policy of the Soviet Union. This is the aim of the Peace Programme for the1980's, adopted by the 26th Congress of the Communist Party of the Soviet Union. It embraces measures for reducing both nuclear missile weapons and conventional arms, it contains proposals for settling existing and preventing new conflicts and crisis situations, it is permeated with a desire to deepen detente and develop peaceful cooperation between the countries of all continents. It

expresses the readiness of the Soviet Union to conduct negotiations on all the current issues of peace and security, to give close consideration to all the constructive ideas of other states.

In our nuclear age dialogue and negotiations are needed equally by all, just as all need peace, security and confidence in the future. There is now no other sensible method of solving disputed problems, no matter how acute or complex they may be, except negotiations. Not a single opportunity that exists must be missed. There is no time to lose!

Each day lost for negotiations increases the risk of a nuclear conflict. The solution of vital problems confronting each people and all peoples is being deferred. There is no time to lose!

In our time all those who by their actions are encouraging the arms race and the further stockpiling in the world of weapons of mass destruction of people, who are advocating the use of force to settle disputed issues between states or who are just turning a blind eye to the dangers now threatening the world, are in fact pushing mankind towards the abyss.

The Supreme Soviet of the USSR appeals to the legislative bodies of all countries to speak out firmly in favour of negotiations leading to the prevention of another round of the nuclear missile arms race, in favour of honest and equal negotiations without any preconditions or attempts to dictate terms.

The Supreme Soviet of the USSR trusts that its Appeal will receive the full consideration and attention which this most important and most burning issue of our time deserves. It firmly believes that the Parliaments possess the necessary powers and authority to press effectively for curbing the arms race and for disarmament through negotiations. For its part the Supreme Soviet of the USSR will continue to make its contribution to creating a climate conducive to achieving positive results as the outcome of negotiations.

Peace belongs to all mankind and in our time it is also the primary condition of our existence. Only through joint efforts can and must peace be maintained and reliably safeguarded.

Moscow, Kremlin, June 23, 1981

The Supreme Soviet of the Union of Soviet Socialist Republics

The Armed Forces

The Armed Forces of the USSR have the following arms of the services: the Strategic Rocket Force, the Land Forces, the Air Defence Force, the Air Force and the Navy.

For purposes of troop control the territory of the USSR is divided into military districts and there are fleets and flotillas on the seas.

The Soviet military doctrine is based on the fundamental principles of the Leninist policy of peace and peaceful coexistence of states with different social systems. Evolved on the basis of military science, it rests on the USSR's political and economic might and defines the essence and character of possible wars and the tasks of training the Armed Forces in maintaining their constant combat readiness to defend the socialist homeland.

The Armed Forces are manned by rank-and-file and junior command personnel drafted in accordance with the country's law on universal military service. A person may be granted a deferment form military service for the following reasons: to continue studies, to look after sick and old parents, and so on. If a draftee, on reaching the age of 27, still has the right for a deferment, he is released from active service in peacetime. The term of service is two years in the Army and three years in the Navy. For those who have a higher education and consequently a better preliminary training, the term is one and two years respectively.

The officer corps is formed on a voluntary basis with training given at higher and secondary military schools admission to which is open to all who have passed the entrance examinations. About half the officers have a higher military or specialised education.

Servicemen enjoy all the rights and have all the duties stipulated by the Soviet Constitution for Soviet citizens.

While working consistently to strengthen world peace, the Soviet state equips its Armed Forces with everything necessary to ensure the security and defence capacity of the USSR. Everything for effective defence, nothing in excess of this—this is the essence of Soviet military policy. The Soviet Union has never armed itself for armament's sake; it has never been and never will be an initiator of the arms race.

So long as there is a threat of war, so long as there is tension in the world, the Soviet Union will maintain such a military potential that is necessary for protecting the peaceful life of the Soviet people, of everything that they and the peoples of the socialist community who regard the USSR as the guarantor of their peaceful life have created.

The Soviet military doctrine combines the peace-loving nature of the country's foreign policy and the Soviet people's readiness to repel any aggressor.

The USSR spends on the defence about 20 per cent of what is allocated for social and cultural needs.

National Economy

The Soviet Union produces 20 per cent of the world's industrial output: this is more than the world's total output 30 years ago.

The strategic objective of the Eleventh Five-Year Plan is to further raise the Soviet people's wellbeing. The focus is Siberia and the Soviet Far East, with their large resources of energy and raw materials, and also Soviet Central Asia, where a very favourable combination of labour resources and raw materials is conducive to the build-up of economic capability. The plan provides for the development of fuel, energy and raw material producing centres in Siberia and Kazakhstan and the construction of energy-intensive industries.

The development of the Eastern regions with their vast tracts of land cannot be completed within just one five-year period. In planning this strategic manoeuvre the government has devised a ten-year programme.

A number of economic solutions for the coming decade has been prompted by the tense demographic situation. The country has reached a turning point, passing from a period of development with a large growth of labour resources to that with practically zero growth. The shortage of labour is expected to become very acute during the 12th Five-Year Plan period, between 1985 and 1990.

Therefore plans for the 11th Five-Year period call, on the one hand, for measures to put right the existing territorial disproportion between the need for labour and its availability and, on the other, for preparing the country's economy for operation in the predicted demographic vacuum of the'90s. Central Asia is expected to continue to account for the largest growth of the able-bodied population and so the task set out in the plans for 1981-1985 is to speed up the development there of the labour-intensive branches of agriculture, consumer goods and engineering industries. Hence, there will be a virtual ban on the construction of new industries in the country's European part.

In the '80s extensive development has been giving way to intensive development. An economic strategy based on this approach was adopted on a large scale in the previous decade. Nevertheless the '70s set a record in absolute output growth, particularly in the raw material branches: the USSR accounted for a quarter of the world production of minerals. Besides, the Soviet Union, a country with the world's highest level of employment, a country which has never experienced unemployment for half a century, continued to create about two million jobs a year.

The 11th Five-Year Plan (1981-1985) sets rather modest targets for the output growth of raw materials in absolute figures. The national income is to go up by about 20 per cent. It is expected that 85 to 90 per cent of the increase will be achieved through higher social labour productivity.

What, then, is to be done to secure a more efficient use of the economic capability?

Firstly, the available resources are to be used **more economically**. As the chief mining centres are moved to the difficult-to-reach and sparsely populated areas in the East and North, the cost of raw materials keeps rising. Meanwhile, the losses of raw materials, after they leave the mines for different stages of industrial production, are unjustifiably high. For example, in metal-working much is lost in shavings. Thus concern is not only for higher metal output but also for economising metal in the end phases

of utilisation. A tight economic policy is to be pursued in all the consuming industries and since 1981 all the economic development programmes are to have a section on the secondary utilisation of resources.

The comprehensive use of natural resources. The country is seeking to increase its natural wealth through an intensive prospecting effort. This policy is to continue in the '80s, including the wide use of the latest aerospace methods. At present, however, extremely rich deposits are all too often oriented to the mining of one particular type of raw material. The '80s are to see a turning point in this respect. The mining industry is to utilise the experience gained in the non-ferrous metal sector where scores of elements are mined as by-products.

New technologies. The country's scientists and designers have undoubted achievements to their credit, yet the results of their work have been put to use far too slowly. There are some examples. Although the USSR leads the world in the output of machine tools with digit-programme control, it is behind such countries as the United States or Japan in their effective use. Inertia in the traditional metal industry has slowed down the introduction of continuous steel casting, although the USSR was the first to adopt this method. Vigorous steps are currently being taken to reduce to a minimum the distance between research centre and factory shop. Priority is given to the most advanced technologies such as powder metallurgy (1,000 tons of items made of powder replace 2,500 tons of rolled steel, economising the labour of 200 workers) and multilayer pipes for gas pipelines (the country is laying pipelines on such a wide scale that although it leads the world in the output of pipes, it is nevertheless compelled to import large quantities of them), etc.

Comprehensive target-oriented programmes. When a team of oil experts and businessmen from the USA and Canada visited Tyumen Region in 1966, their consensus was that it would be unrealistic to try to develop a large oil-field amidst the swamps of Western Siberia within a short space of time. That year the area's oil wells yielded one million tons of oil and gas condensate. By the end of 1980 the output had topped the 300-million mark.

This rapid thrust could have been hardly possible except for a comprehensive target-oriented programme devised for the development of Western Siberia.

Earlier such programmes were an exception rather than the rule. At present they are becoming part and parcel of long-term national plans. They have come into the limelight mainly because the structure of the Soviet economy has grown much more complex. More than a hundred new industries have come into being and there is a growing number of problems which cannot be solved within the framework of one ministry or region. The drawing up of such programmes, however, does not mean that a centralised plan is to be scrapped. Moreover, the number of such programmes will be limited. The point is for them to get priority consideration in the supply of resources. If there were too many of them the sense of priority would be lost as it would be too complicated to carry out a multitude of programmes at the same time.

It has been decided that programmes of vital importance for the country's economy are to be carried out by 1990 stage by stage. These include the food programme, programmes for economising fuel and metal, for reducing the application of manual labour, increasing consumer goods output, boosting the production of farm and other machinery, expanding the power industry and transport, and the economic development of the Baikal-Amur Railway zone.

Industry

Scientific progress gives birth to new industries. The range of products is widening. Connections between related industries are becoming more complex. To simplify their management new production amalgamations are being set up. There are now 4,000 of these integrated economic complexes, in which research and development is concentrated and fused with production. They account for nearly the whole of coal production, 90 per cent of car manufacturing and 80 per cent of tractor building, i.e. nearly half the total industrial output. Organisational restructuring involves modernising and re-equipping new economic units which in the future will become the main production links.

The mining industry. Minerals account for over two-thirds of the value of all raw materials used by Soviet industry. The USSR is the world's only industrial power whose economic development relies entirely on its own mineral resources.

Today, the Soviet Union produces nearly a quarter of the world's mining output. It has become a major exporter of raw minerals and mineral products. It aids some 25 countries to prospect and develop their own mineral resources.

The USSR holds first place in the world for oil output. But the country's oil demand is so great that there is no surplus. At present some 500 oil and oil-and-gas deposits are being worked in various parts of the country. For a long time the area between the Volga and the Urals led in oil production. Though this region still produces up to 100 million tons of oil annually, the first place is now held by Western Siberia where a large fuel and energy producing base has been created which yields nearly all of the Soviet Union's increment in oil and gas output.

The total length of Soviet main oil pipelines exceeds 60,000 kilometres. The double-pipe oil main *Druzhba* carries 50 million tons of oil annually from the Tatar Autonomous Republic in the Soviet Union to Poland, Hungary, Czechoslovakia and the German Democratic Republic.

The daily gas output considerably exceeds 1,000 million cubic metres. An integrated gas supply system brings fuel to 1,500 cities and towns. This technological complex comprises gas deposits, underground storage facilities, gas-processing plants and distributing stations.

When a strong earthquake occurred on the morning of April 8, 1976, near Gazli, where the transcontinental Central Asia—Centre, Bukhara—the Urals and other gas pipelines begin, the powerful compressor station supplying gas had to be stopped. The

Production of electricity, oil, gas and coal

	1960	1977	1978	1979	1980	1985 (target)
Electricity (thousand million kwh)	292	1,150	1,202	1,239	1,295	1,550-1,600
Oil (including gas condensate, million tons)	148	546	572	586	603	620-645
Gas (thousand million cubic metres)	45.3	346	372	407	435	600-640
Coal (million tons)	510	722	724	719	716	770-800

main dispatch centre of the integrated gas supply system was immediately informed of this and it arranged for the delivery of more gas from deposits in Turkmenia and the Tyumen and Orenburg regions. There was not a single disruption of gas supply anywhere at any time.

The total length of the country's main gas pipelines is 130,000 kilometres.

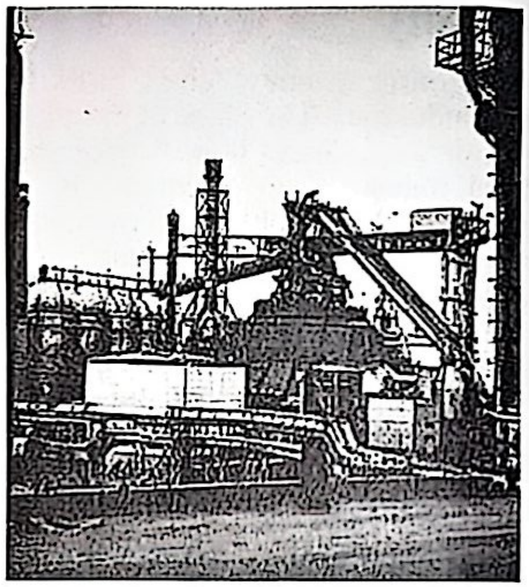
Other recipients of Soviet gas, besides socialist countries, are Austria, the Federal Republic of Germany, Finland, Italy and France.

The USSR accounts for nearly a quarter of all coal mined in the world. Coal output increases through expansion of new coal basins in Eastern Siberia and Kazakhstan where coal lies near the surface and opencut mining is possible. One-third of the country's coal is being mined in this manner.

Coal production is also increasing in the old coal basins. The workers of the Kalinin mine in Donbas have begun sinking a shaft seven metres in diameter and one kilometre long with the help of a new shaft-sinking unit, the SK-IV. The new machine breaks the rock, hauls it to the surface by a pneumohydraulic system and sets up concrete supports. This is all done by remote control, thus eliminating all manual operations.

In the next ten years the importance of coal will grow considerably. It will remain the basic fuel for power stations until the coal-fired plants are replaced by nuclear, solar, wind and geothermal plants. And although the share of coal in the Soviet Union's fuel consumption has been diminishing (going down to 27 per cent), in absolute figures coal production has been growing.

New mining methods are being developed (hydraulic mining and the gasification of coal). Currently under consideration is a chemical mine where special solvents are pumped



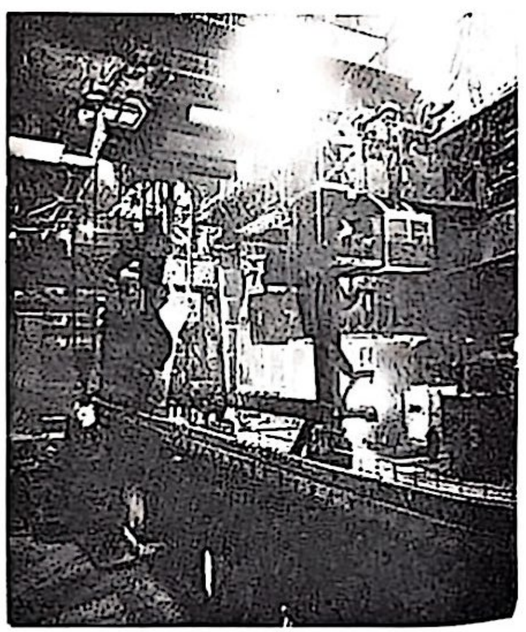
Blast furnace in Krivoi Rog

underground and then a coal solution brought to the surface like oil.

The iron-and-steel industry. The Soviet Union has more than 300 iron-and-steel plants. In recent years iron-and-steel manufacturing has been developing rapidly in Kazakhstan and Siberia.

The Soviet Union has blast furnaces with a capacity of 3,200 cu.m and has built a still larger one, of 5,000 cu. m, in Krivoi Rog. The second such furnace is being built in Cherepovets. The construction of the first electric metallurgy works has begun in the town of Stary Oskol. Being constructed with the help of the Federal Republic of Germany, the Stary Oskol plant will use the ore of the Kursk iron-ore basin. The ore is mined by the opencut method, and the workings cover such a large area that it can be spanned visually only from an aircraft. The necessary energy will be supplied by the Novovoronezh and Kursk nuclear power plants. The large-capacity Orenburg—Centre gas pipeline, too, runs not far from the site.

Converter shop of the West-Siberian iron and steel works



What will the elimination of the time-consuming blast-furnace process mean? In the first place, there will be none of those costly metal giants, blast furnaces, themselves. Secondly, coke, which accounts for nearly two-thirds of the costs of producing pig iron will no longer be burnt. And finally, there will be no need to produce pig iron itself so smelting and transport costs will be eliminated. Nor will the inhabitants of Stary Oskol see palls of smoke above the steel works, a familiar scene at conventional steel smelting plants. Consequently, many environmental problems will simply not arise. And another important consideration: the steel smelted in the voltaic arc of electric furnaces will be of much better quality than that smelted from pig iron.

The current trend in steel smelting is for large oxygen-converter and electric-smelting shops. Converters with capacities of up to 400 tons are already in operation and more are being built. Their annual output is eight to ten million tons.

The open-hearth furnace compared with the converter or the electric furnace is like a steam engine beside an electric or diesel locomotive. Its efficiency is much lower and it is gradually leaving the scene.

Metal makers are trying to combine steel smelting and the manufacture of products into a single process. Blooming and slabbing mills have been replaced by continuous casting plants. Attempts are being made to combine casting with rolling and this has already been put into practice in the production of copper and aluminium.

Soviet scientists and engineers have developed technology for removing impurities such as sulphur, phosphorus and oxygen. This also helps to attain a close-packed structure and smooth surfaces. The technique is called electroslag resmelting and involves pouring molten metal through highly active liquid slag. This filters out harmful impurities and when the metal cools, it forms solid ingots of the required shape and weight. The invention has been patented in many countries and even Swedish metal makers, renowned throughout the world as manufacturers of high-quality steels, have ordered equipment for the new method.

Mechanical engineering. The Soviet Union holds first place in the world in the manufacture of electric and diesel locomotives, metal-cutting lathes, tractors and farm machinery. Among the latest models are rotary excavators, each capable of filling two trainloads within one hour, installations for drilling up to 16 wells from one platform, diesel locomotives with 6,000 hp engines, 75- and 120-ton dump trucks, combine harvesters with a capacity of 7 kg of grain per second, and a 2,400,000 kw nuclear reactor.

Systems of machines and instruments have been built which have mechanised and automated whole production cycles. One such system lays up to one kilometre of hard-surface motor road in an 8-hour shift.

The number of industrially employed robots, or programme-controlled automatic manipulators, has reached 800. Minirobots working at automatic assembly lines of watch factories have increased productivity sixfold.

The Soviet Union has built its 10-

"Kolos" combine harvester

millionth **tractor**. Its tractor-building industry manufactures a variety of models for different purposes, from the 7-hp *Rioni* designed for orchards and gardens to the powerful wheel tractor *Kirovets-701* whose designers and builders were awarded the Lenin Prize. Various modifications make the *Kirovets-701* capable of doing 50 different jobs. It is widely used in the timber industry, in construction and in mining. In agriculture it does fieldwork and it is also employed as a loader, bulldozer, scraper, snow plough and haulage tractor. Another model, MTZ-80, is a tractor which uses 230 accessories, a world record of its kind. These new models feature improved comforts: minimum vibration, optimal cab temperature and good sound-proofing and insulation.

The international agricultural association of socialist countries, *Agromash*, developed combine harvesters for picking tomatoes, currants and grapes, which are said to be nearly as sensitive as human hands.

The Soviet Union makes all types of **metal-cutting machines**, including ultra-precision lathes, automatic machines and automated production lines. The country's machine-tool fleet includes nearly five million such units. Over 7,000 numerical programme-controlled metal-cutting machines are built annually. Engineering works in Kramatorsk built its first giant machines capable of working shafts up to 20 metres long and weighing many tons. The first few **laser machine-tools** have been installed. Measures are being taken to increase the production of automatic equipment with miniature numerical-control systems. More than 136,000 mechanised production lines and 24,000 automatic lines are in operation.

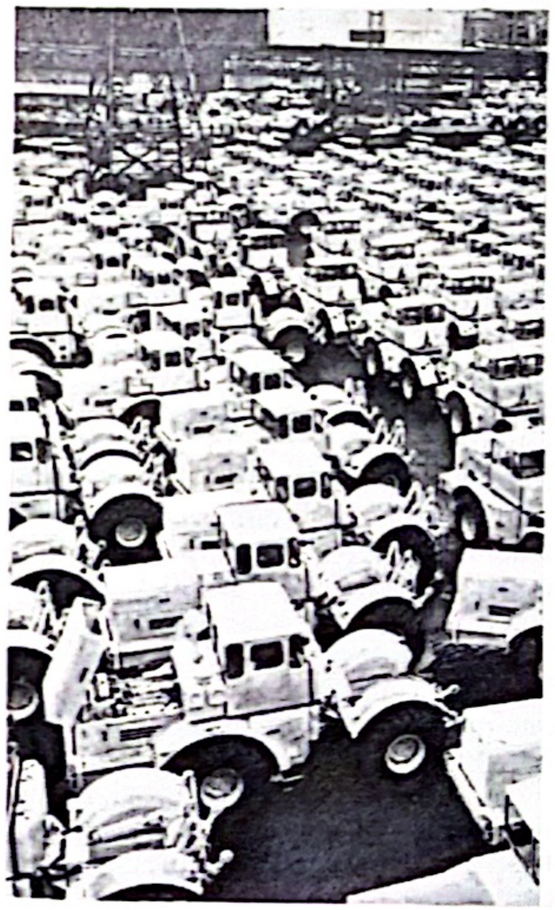
Manufacture of motor vehicles (in thousands)	**1960**	**1977**	**1978**	**1979**	**1980**
	523	2,088	2,151	2,173	2,199

Highly specialised sea and river craft have appeared during the past Five-Year Plan period. They include boats to transport containers, barges, chemicals, and gases, as well as ice breakers, floating drilling rigs and vessels for exploring sea shelves.

A new development are sea vessels capable of navigating shallow waters and reaching points which have no wharves or loading cranes, such as the settlements of geologists, fishermen, Arctic explorers and reindeer breeders. More rapid passenger ships with hydrofoils are being built. Their usual speed is 30-35 knots. Soviet 100-ton floating cranes and floating docks of up to 12,000 tons are in demand on the world market.

To prevent sea pollution all tankers have their tanks hermetically sealed, they have a double bottom and, if designed for navigation in the Arctic or the Antarctic, they also have double sides. Many tankers have their steering system duplicated against an emergency.

K-701 tractors



Container ship

Seven thousand **motor vehicles** of 150 types including 4,000 cars, roll off Soviet assembly lines every day. They range from the mini cross-country car *Volyn* to the big diesel truck *KamAZ* and to 40- and 75-ton *BelAZ* dump trucks. One of the novelties is the *Niva* which combines the comfort of a modern passenger car with the ruggedness of a cross-country vehicle.

Fundamentally new **lifting mechanisms** have been built: 160-ton capacity assembly cranes and 1,000-ton capacity tackle hoists. These allow the installation of equipment of practically any size and weight. Thus, at the *Azovstal* plant assemblymen, using a special dolly and jacks, installed within four hours the foundation for an already assembled converter weighing over 1,000 tons.

Electric power. The Soviet Union now has 57 **fuel-burning power stations**, each having a capacity of more than one million kw. Such stations account for nearly 80 per cent of all electricity generated in the country.

Cascades of **hydropower stations**, which simultaneously solve the problems of irrigation, water supply, navigation and fishing, have been constructed on the country's major rivers.

Until recently the Bratsk hydropower station (4.3 million kw) on the Angara was the world's largest. The amount of concrete that went to build

Construction site of the Sayan-Shushenskaya hydropower station

its dam would be enough to build a town of 600,000 residents. Should its electricity be produced by burning fuel, 15 million tons of coal would be required annually, the equivalent of 250,000 goods wagons. The Bratsk station has now been surpassed by the Krasnoyarsk power plant (6 million kw) on the Yenisei. Farther up the Yenisei a still bigger project, the Sayan-Shushenskaya hydropower station, is being put into operation. By 1983 its ten generating units will have a combined capacity of 6,400,000 kw. To complete the project a 245-metre-high dam will have to be built in one of the gorges of the Sayan range. The dam is still under construction but the station has already begun generating electricity.

Large energy systems are linked by high-tension transmission lines. In the European part of the USSR it is possible to operate 900 power stations from a single control panel in Moscow.

No energy crisis threatens the Soviet Union. However, there are problems with the transportation of fuel. The bulk of the country's reserves are in the east, while the European part consumes 80 per cent of the energy produced.

The energy crisis, inflation and the economic difficulties in the West make themselves felt in an indirect way. After all, the economy of the socialist countries is not separated by an impenetrable wall from the rest of the world.

However, these problems, do not change the main thing: the Soviet Union has ample fuel resources. It is only a question of how to manage them best.

Atomic power engineering is developing at a particularly fast rate. The world's first nuclear power plant in Obninsk which is now 25 years old was followed by the Beloyarsk, Novovoronezh, Leningrad, Kursk, Chernobyl, Kola, Bilibino, Armenian and Shevchenko atomic power stations.

Soviet atomic power stations are fitted with standard slow reactors of a one-million-kilowatt capacity. A 1.5-million-kilowatt reactor has been designed. A fast reactor is at work in the town of Shevchenko. The Kurchatov Institute of Atomic Energy has completed the general design of a

nuclear thermal station. Practical experience in this field has been obtained at the atomic power station in Bilibino, in the Arctic, which supplies both electricity and heat to the inhabitants of the Chukchi peninsula.

In 1979 a 500,000 kw **magneto-hydrodynamic** (MHD) **power engineering** pilot project was started in Ryazan. This first-generation MHD station will have an efficiency of 50 per cent as against 40 per cent in the best thermal power stations and will consume 20 per cent less fuel. In MHD type stations the fuel burns at a temperature of 3,000 °C and turns into plasma which, under the influence of a strong magnetic field creates an electric current.

The chemical industry has no equal for rates of growth. Capital investment in chemical production in the 10th Five-Year Plan period was double the figure for the previous five-year period. The output of fertilisers is equivalent to nearly 25 million tons of pure nutrient a year. The output of plastics is rapidly expanding, as is the production of man-made fibre and synthetic resins, and detergents.

It is widely held that the chemical industry is the chief pollutant of the environment. Scientists, however, have devised many new technological processes which are ecologically clean.

Consumer goods industry. Problems linked with the output of consumer goods have now become perhaps the most favourite subject of press criticism, although shops are full of clothes, shoes, tape recorders, refrigerators, and TV sets. The situation on the domestic market is that consumers have enough money while shops are stocked with a sufficient amount of goods. However, not everything is purchased. This is a conflict which has developed between demand and supply. It is not a shortage in general. It is a shortage, in particular, of those goods in great demand: the new, fashionable, and diverse, capable of suiting a variety of tastes.

While with such commodities as refrigerators, watches and cameras the situation is more or less satisfactory, the garment, textile, shoe- and furniture-making industries are still too slow to respond to consumer demand. To amend the situation, it was decided to carry out a comprehensive target-oriented programme for boosting consumer goods output. The programme is given top priority in the Five-Year Plan.

The drive to restructure relations between production and consumption is directly linked with changes in the economic mechanism. The point is that the prevalence of quantitative indicators in the consumer goods industry has led to the producer's "diktat". The producer used to sell his goods on the market under the principle "take it or leave it". At present the consumer has the last word. A new system of planned targets and standards has been introduced since 1981 to stimulate higher quality of

Output of certain durable goods (in millions)

	1960	1977	1978	1979	1980
Radios and radiograms	4.2	8.7	8.7	8.5	8.5
TV sets	1.7	7.1	7.2	7.3	7.5
Household refrigerators	0.5	5.8	6.0	6.0	5.9

output and also to encourage the unfailing fulfilment of delivery commitments, etc. Steps are being taken to extend the system of bonuses for higher quality and new designs.

The modernisation and technical re-equipment of many factories are to become one of the key elements of the programme for boosting consumer goods output. This applies first of all to the garment and textile industries.

The output of furniture, plates, dishes, and other household and leisure goods is to go up nearly 50 per cent over the five years. The plan underlines that priority will be given to the production of new, technically sophisticated items with a high level of performance and which are aesthetically attractive.

It should be pointed out that in 1981 the growth rate in the consumer-oriented industries exceeded for the first time that of heavy industry. Besides, a number of enterprises unrelated to the output of consumer goods have now mastered their production. All this indicates that the people's wellbeing gets top priority in budgetary allocations.

The food industry. The Soviet Union has many automated bakeries, sugar refineries and dairy plants. The food industry today turns out over 30,000 types of products. The range of children's foods has increased; thus, there are over 50 kinds of tinned fruit, vegetables and dry mixes. The production of frozen foods is growing.

Within the past three years scientists have devised over 400 new types of food, including products enriched with vegetable and animal proteins, and those with fruit flavourings.

The textile industry. Demand for cottons and linens is constantly growing. Although the Soviet Union leads the world in per capita production of **natural fibres**, such fabrics as cotton, sateen and linen are in short supply. The reason is that besides drapery shops and clothes factories industrial enterprises also use the products of the textile industry.

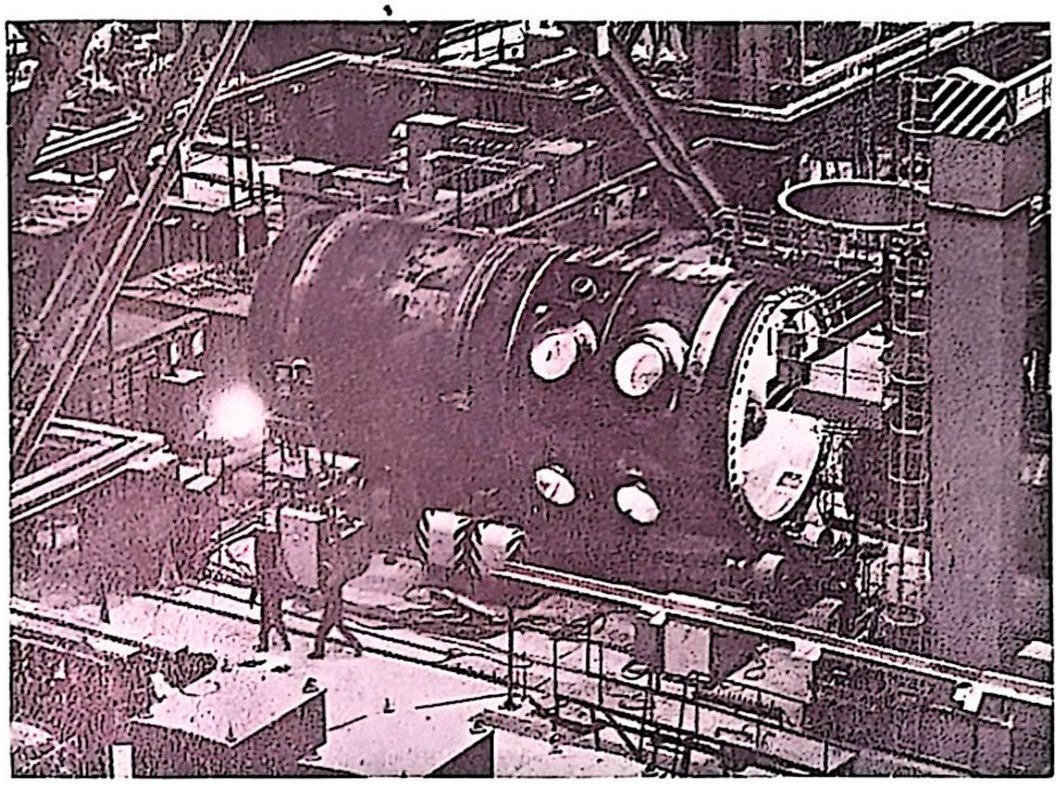
In old Russia, canvas, for instance, was manufactured out of flax and used mostly for making sails. Although square-rigged ships are a thing of the past, sailcloth is still manufactured in considerable quantities. Today it is used for the making of tents, conveyer belts, etc. In the case of linen, 45 million metres is used every year for wiping and packing purposes alone, and over 1,000 million metres of cotton and cambric is needed for various industrial processes.

A sharp rise in the consumer demand for natural fibre fabrics compelled the government to restrict their use in industry. To help meet consumer demand the chemical industry came to the rescue. In 1980 it started producing a new type of rayon fibre, in many respects close to cotton. Thus, it is almost as strong when damp and it compares well with the best types of cotton both in its pure form and when combined with other fibres.

Output of textiles (in thousand million square metres)

	1960	1977	1978	1979
Cotton	4.8	6.8	7.0	7.0
Woollen	0.4	0.8	0.8	0.8
Silk	0.7	1.6	1.7	1.7

CRADLE OF ATOMIC POWER ENGINEERING



Ten thousand people, a quarter of whom are engineers and technicians, are working at the Volgodonsk Atomic Engineering Plant (Atommash), a plant with electronic metal-cutting lathes of mammoth size, with tall radiation chambers and electric furnaces so huge that a truck can easily enter them. This plant is now starting mass production of 1,000,000-kw nuclear reactors.

One cannot yet see the finished product— it takes three years to manufacture each reactor.

The shell of the first reactor, which took more than two years to build, has already been installed. Its assembly was completed six months before schedule to mark the opening of the 26th CPSU Congress. The future power units are 15 metres in height, 5 metres in diameter and weigh 550 tons. Eight such giants will be leaving the assembly line each year. Before being sent to customers the reactors will be tested in underground caissons under operational conditions.

Since the reactors are too bulky to be transported by rail, the Atommash plant has been built on the banks of the Volga-Don shipping canal which links up with the Baltic and White Seas in the North, and through them with the Atlantic, and in the South with the Caspian and Black Seas from which ships can travel to any part of the world.

Area—69,700 sq. km
Population—5,000,000
Capital—Tbilisi
(population 1,100,000)

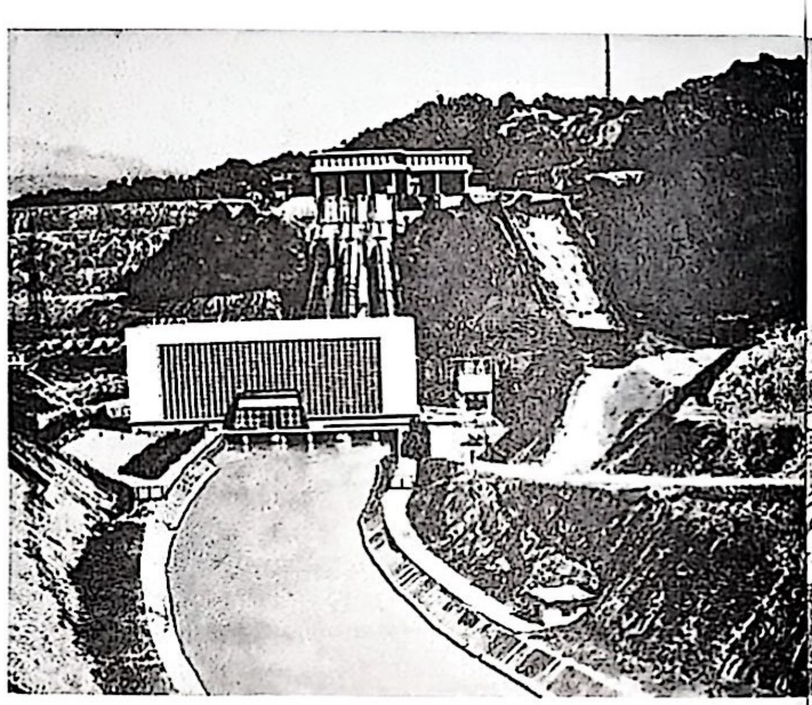
Nature has been exceedingly generous to this southern republic wedged in between the Caucasus mountain ranges and the Black Sea. It is rich in minerals, particularly manganese ore and coal, on whose base a heavy industry has been built up. Georgia produces cast and rolled steel, automobiles, hydrofoil ships, electric locomotives, airplanes and outer space navigation instruments.

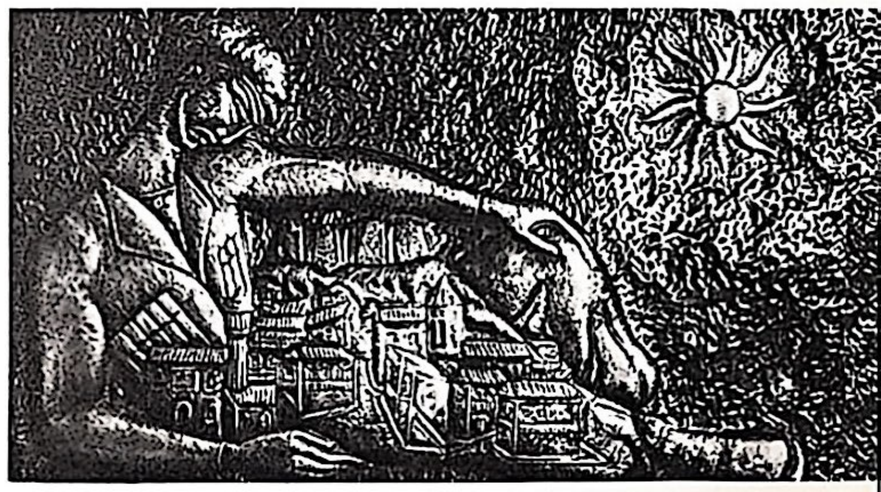
In the Colchis lowland on the Black Sea coast lies the zone of humid subtropics. Their fertile alluvial soils give bumper crops of citrus fruit, grapes, tobacco, medicinal plants and essential oil crops. Here are the country's biggest tea plantations. The Georgian "Extra" brand tea has been awarded the Great Gold Medal at the Leipzig fair for its subtle aroma. Teapicking machines are used in the valleys while in the foothills tea pickers use special leaf-cutting devices.

Chasers working with gold and silver have given new life to an ancient art. Traditionally regarded as an art of decorating small objects, chasing is now also a monumental art. Chased panels have found their way into people's homes and grace the streets and squares of Georgia. They are also part of the interior decor of the United Nations building in New York.

Ever since Nona Gaprindashvili, a Georgian girl, won the title of world chess champion and became the world's only woman International Grand Master the Chess Palace in Tbilisi has been drawing an ever increasing number of women chess players. Many of them are graduates of a secondary school where chess is taught as a special subject or have completed the course given by the chess department of the Institute of Physical Culture. So it is not by chance that the title of woman's world chess champion is still held by a Georgian—Maya Chiburdanisze, and several Georgian women are aspiring to the title.

Power station in Colchis. On the outskirts of Tbilisi. Centenarians. Tea picker. Georgian metal-chasing. Grapes have ripened in Kakhetia. World chess ex-champion Nana Gaprindashvili with her son. Mountain road.





Area—29,800 sq. km
Population—3,000,000 million
Capital—Yerevan
(population 1,000,000)

Armenia is an ancient mountain country, and it has an authentic "birth certificate" to prove its age: in its capital Yerevan there is a basalt block with a cuneiform inscription saying that the city was founded in 782 B.C., which makes it older than Rome and Athens. Stone is the chief building material, and carved stone ornaments lend a particular charm to Yerevan's architectural style.

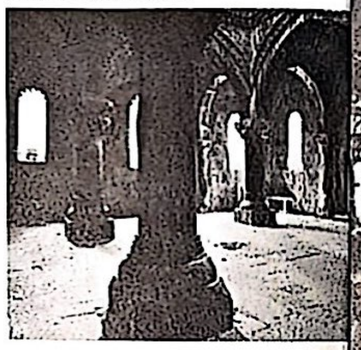
Armenian peasants called their country Karastan, meaning "land of stones". For ages they cleared their fields of rocks and boulders. In the mountains one still comes across ancient castles and temples embellished with "stone lace" and fretwork. There is even a special Institute of Stone in Yerevan. Stone is also used in the production of cut glass, pipings, mineral fibres and fertilisers.

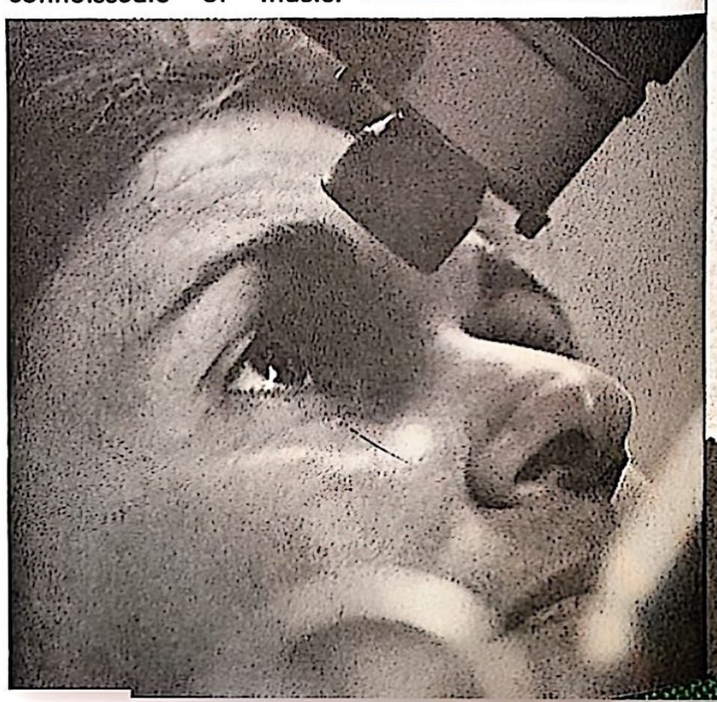
Armenia has an abundance of rock and very little land. Fertile valleys lie at the foot of the mountain ranges crowned by the extinct volcano Aragats. They are crisscrossed by a network of irrigation canals whose total length is half the length of the Equator. Irrigated lands account for 80 per cent of the republic's tobacco, grape and peach harvests. Armenian brandies are world-famous. Winston Churchill, Britain's ex-Premier, preferred the Armenian "Dvin" brandy to all others.

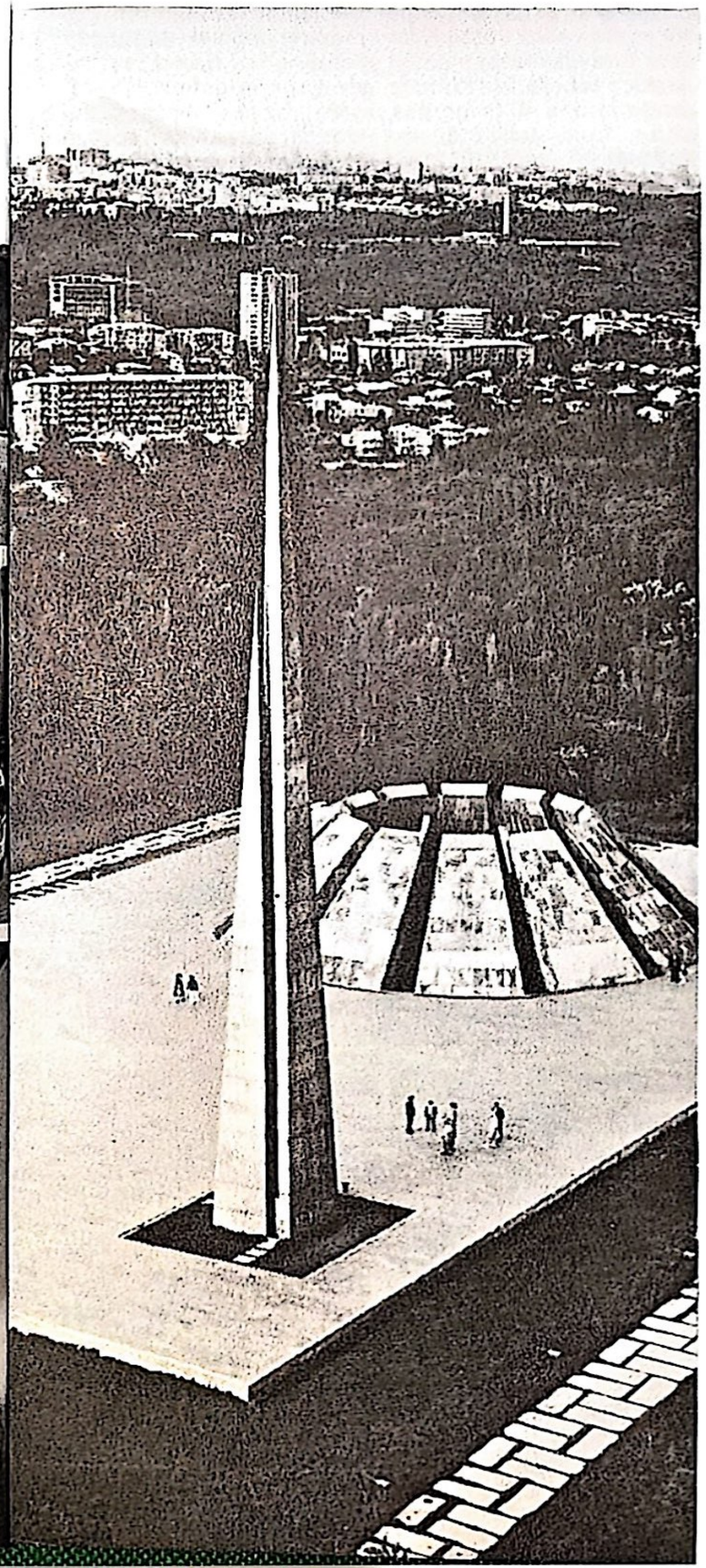
In the mountains crops are gathered literally from ground rock. Hydroponics is spreading to bald rocky slopes, saline lands and even to the roofs of farmers' homes.

But nevertheless there is a shortage of water. Nearly a third of the water from Lake Sevan, a large mountain lake, was used up by the irrigation systems in the Ararat valley. To save the lake from being drained of its water a 50-kilometre-long tunnel was laid through the mountain range channelling the waters of the Arpa river into Sevan.

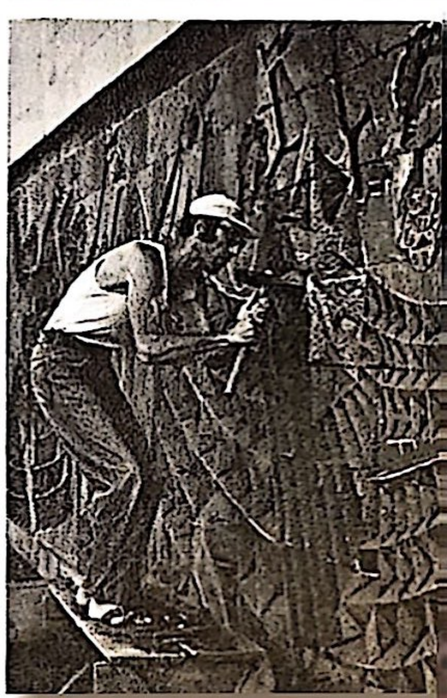
Of all the arts the Armenians love music best. Nearly every village has a music school. Armenian farmers say that only a musical person can consider himself educated. That is probably why Armenia has so many star musicians and such a large number of connoisseurs of music. Musicians and singers from abroad, and especially those of Armenian origin like Charles Aznavour (France), Lucine Amara and Lily Chukaszyan (USA), enjoy performing before Armenia's sophisticated listeners.







In an ancient temple. Memorial to the victims of the massacre of Armenians by the Turks in Yerevan. In a children's art gallery. Armenian brandies. Gegard Temple. Astronomer. Artist.



Area—86,600 sq. km
Population—6,000,000
Capital—Baku
(population 1,600,000)

Azerbaijan is a traditional oil producer. Today more and more oil derricks are being built in the open sea. One hundred kilometres from the shore a new town, Neftyaniye Kamni, has risen on man-made islands connected with the mainland by a long trestlework with a total length of 200 km. The town has five-storey houses, canteens, polyclinics, schools, and even a secondary technical school. There is also a greenhouse and a landing site for helicopters.

Its oil industry fleet with floating derricks makes it possible to develop new oil deposits in deep waters. Underwater oil pipelines are replacing oil tankers. Oil extraction and processing goes hand in hand with the development of new machines and devices for the oil industry, and a large chemical industry has been established on the basis of oil and natural gas.

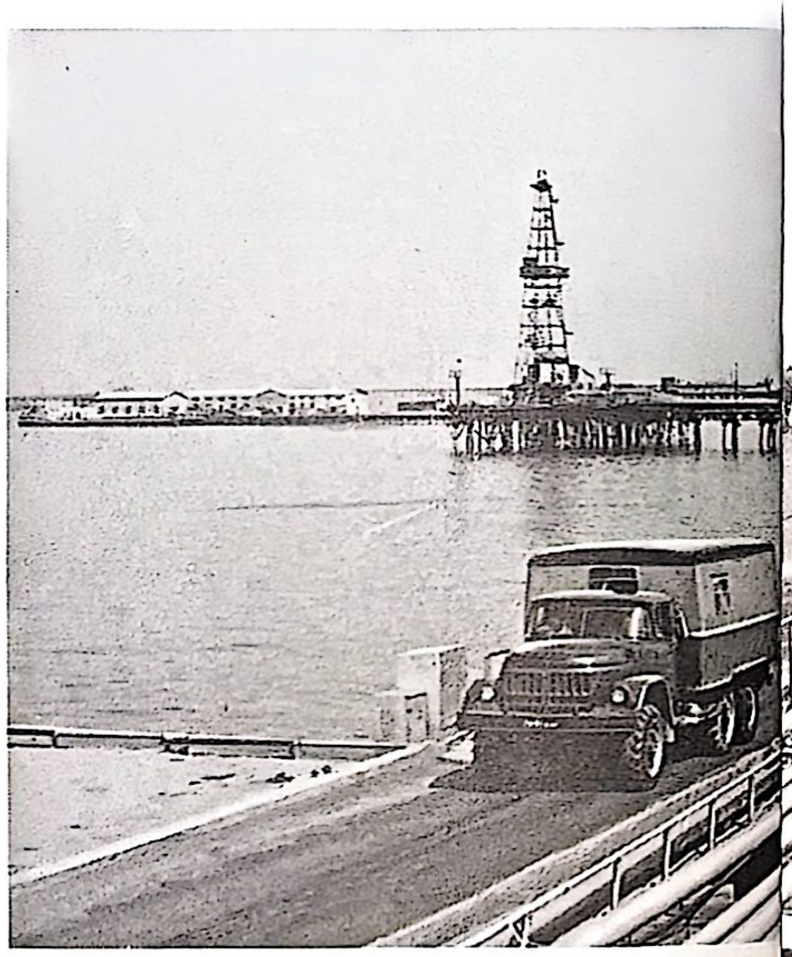
At one time Azerbaijan's rapid industrialisation threatened to pollute the Caspian waters. The problem has been successfully solved by "sealing off" the extraction and transportation processes. The vessels are equipped with special systems and the sludge is delivered to purifying stations.

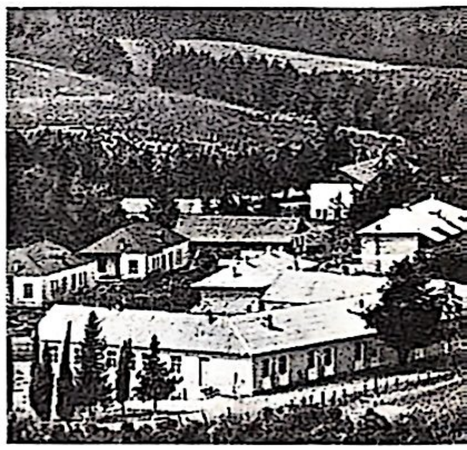
Nearly all of its farmlands are in the valley of the Kura river and its tributary, the Araks, where cotton is grown along with grapes, citrus fruit, tobacco, tea and saffron. Here salination of soil has become a threat to cultivation; over half of the lands are salinized and require special treatment. Farming is based exclusively on irrigation.

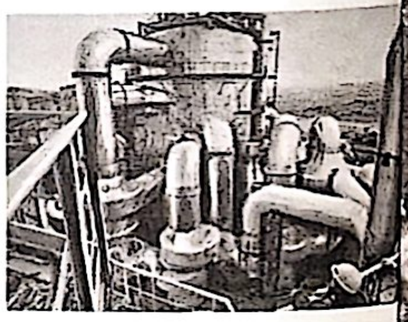
Azerbaijan has the world's only known source of naphtalane, a wonder-working substance that is used for curing many diseases, from severe burns to thrombophlebitis. Its discovery has given rise to a resort town called Naphtalan. It has a "museum" of crutches which are left here by people who are cured of polyarthritis.

Among Azerbaijan's many folk crafts the art of *shebeke*—fine wooden latticework done without the use of glue or nails—is unique. The traditional window lattices often have beautiful *shebeke* patterns.

Offshore oil-rig town Neftyaniye Kamni ("Oil Rocks"). State farm in a subtropical zone. Master craftsman. Sumgait chemical works. Dam on the Araks river. From rose petals comes delicious perfume. Mountain observatory.







Agriculture

There are 2.3 hectares of farmland per person in the Soviet Union, an impressive figure. However, it keeps diminishing. The population is growing, and more and more land is required for roads, factories, towns and cities.

nology and scientific effort into agriculture. Sizable investments were made in the industries supplying farmers with machinery, chemical fertiliser and mixed feeds and those responsible for construction in rural areas, water management, irrigation and drainage.

Over the fifteen years of this agrarian policy the gross annual output of farms has increased 50 per cent. This is quite a tangible growth considering that the country's population has grown only 14 per cent over the same period. The per capita consumption of meat has increased from 41 to 58 kilogrammes a year and of milk from 251 to 319 litres, while that of potatoes and bread has gone down from 142 to 119 and from 156 to 139 kilogrammes respectively. As we can see, there has been a marked improvement in the diet structure, although the food market is not yet fully saturated. An increase in incomes over those years has naturally led to greater demand, all the more so since the price of staple foodstuffs and consumer goods remained unchanged.

Land use (in million hectares)		
	Farm land	606
	Arable land	226
	Meliorated land	28
	Farmers' subsidiary plots	8

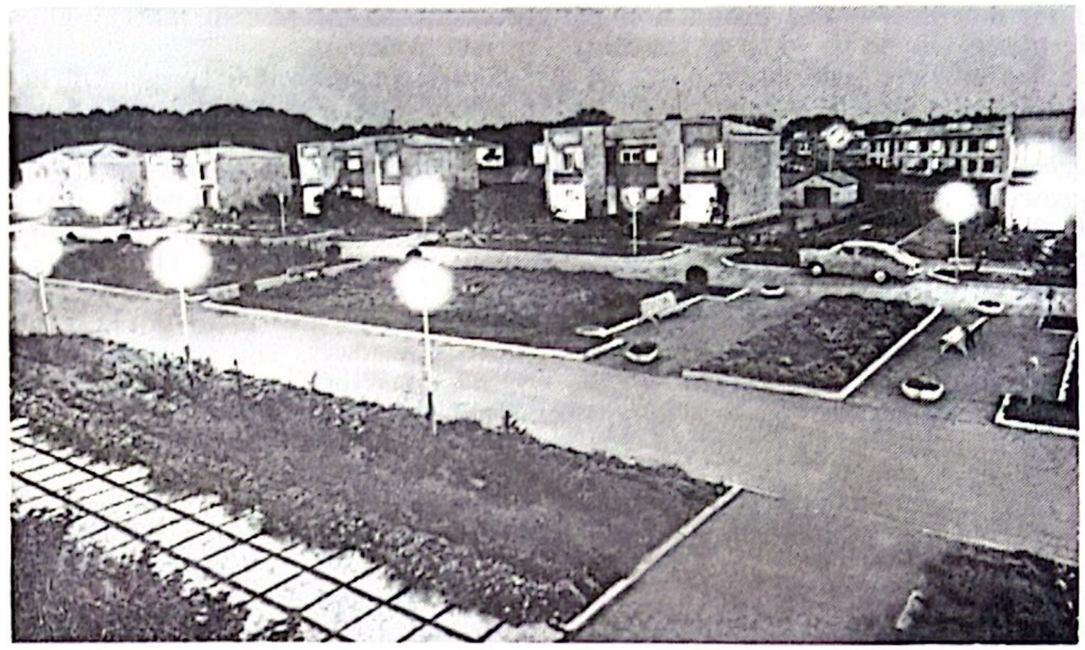
Another important thing: crop farming is unreliable, being too dependent on the weather. Only one per cent of ploughland receives sufficient precipitation and over half of it is in the so-called high-risk farming zone, where the summer is too short but drought occurs frequently and where periods of insufficient sunshine alternate with periods of insufficient moisture. The country's main grain producers—the Ukraine, the Volga area, and Kazakhstan—suffer from lack of moisture. Once in three or four years, or even more frequently, drought hits extensive areas, at times all the way from the Carpathian to the Altai Mountains, severely damaging the crops which are scorched often before they have grown ears.

The bioclimatic potential of the crop farming area of the USSR is half that of the United States or Western Europe. Consequently, harvests are smaller.

Despite difficult weather conditions per capita farm production has reached almost one ton.

Using its high industrial potential, the Soviet state introduced a sweeping shift of resources on a national scale, channelling considerable funds, tech-

The priority growth of the production of food and agricultural raw materials is regarded as the country's most important social and economic objective. To this end, a new food programme is being drawn up to cover all the issues pertaining to the development, planning, management, and financing of the country's agrarian-industrial complex. The idea is to effect a balanced transition of all of its branches to intensive development in the '80s.



State farm near Krasnodar

The food programme provides for a considerable increase in the output of foodstuffs and agricultural raw materials for the consumer goods industry. Significantly, the Five-Year Plan of economic and social development for 1981-1985 has no section on agriculture, as has been the case in all previous plans. Instead it contains a chapter on the development of the agrarian-industrial complex. This includes agriculture with such related sectors as land improvement, the production of fertiliser and machinery as well as the food, hulling-and-milling, concentrated feed industries, etc. The clear tendency is to enhance coordination, to improve economic ties among industries, to make them more integrated, to balance their development, and to organise smooth cooperation in raising the output of farm produce, and improve its storage, transportation, processing, and sales.

To make the food programme a success, it is to be backed by large investments in every sector of the agrarian-industrial complex. As in previous years, these investments are to continue on a high level of more than 27 per cent throughout the '80s.

The increase in the food stocks is regarded in the Soviet Union as the number one national objective. Annual farm output is to go up 12 to 14 per cent between 1981 and 1985. The average grain harvest is expected to rise to between 238 and 243 million tons. The target can be reached, though not without great effort. In the most successful year over the past five-year period grain harvest totalled 237 million tons, while in the worst year it went down to 179 million tons. Farming, then, still depends on the whims of nature a great deal, which adds to the complications.

To narrow annual fluctuations in crop yields, more and more land is being reclaimed to guarantee a stable harvest in the event of drought. During the last 15 years the farm machinery fleet has been renewed to a considerable degree and there has been a substantial rise in the production of chemical fertilisers. In the new five-year period special attention will be given to improving the quality of

farm machinery. The production of fertilisers will go up 44 to 49 per cent. As for power-to-labour ratio in agriculture, the growth is expected to be very considerable — almost 50 per cent. What is important is that output growth in agriculture is to be achieved in the '80s exclusively through higher productivity which is to rise 22 to 24 per cent in the next five years.

As before, the aim of boosting grain production in the '80s is to considerably improve the supply of fodder to the livestock farms so as to achieve a marked increase in the output of meat and dairy products.

Land use. Land in the USSR is state property, which can neither be sold nor bought. Part of the farmland has been given over for perpetual use to collective farms.

Collective farmers and state-farm employees are given, by their collective or state farms, subsidiary plots of land (up to 0.5 hectare) for their private use. These plots are used for growing vegetables and fruits and total 8,100,000 hectares.

Personal subsidiary plots of collective farmers and state-farm employees still account for a considerable share of the country's total production of fruit, vegetables, meat and milk. Thus, they account for 40 per cent of the retail trade in potatoes and 13 per cent in other vegetables.

The majority of people in rural areas keep poultry and livestock. If they have a surplus of meat, milk or eggs they either sell it to the state at fixed prices or take it to the market. The production of meat still falls short of demand, and so the state encourages an increase in individually owned livestock.

Shortages of various types of farm produce in state-run and cooperative shops in towns are only part of the reason for the existence of the markets. Scarcity of some types of produce is gradually losing its stimulating effect on market trade. Thus, eggs, which 10 or 15 years ago sold well at the market, are always bought in state shops nowadays. The situation with milk is much the same. Milk is cheaper in the shops because its production costs at collective and state farms, which supply it to the state-run shops, are lower than on personal subsidiary plots. And so demand at the market has gone down. The range of commodities offered, which is the natural advantage of small-scale production and retail, is increasingly becoming the main reason for the continued existence of the markets.

The mechanisation of agriculture. Currently being tackled is the complete mechanisation of agriculture. There are over 4,600,000 machine operators working on farms. Their number continues to grow, while the overall number of people employed in agriculture is decreasing. Today, every fifth agricultural worker is a machine operator. If to that number you add the workers employed at mechanised livestock farms and inter-farm enterprises and maintenance workers you will get an idea of the new type of farmer, an educated person with technical know-how.

Specialisation. Farming technology is changing drastically as a result of scientific progress, and yet a farmer's

Agricultural producers (in thousands)

Collective farms	27
State farms	21
Inter-farm specialised associations	9

Number of agricultural machines in use (in thousands)

		1970	1977	1978	1979	1980
Tractors		1,977	2,458	2,515	2,573	2,580
Combine harvesters		623	693	700	715	713
Lorries		1,136	1,501	1,522	1,543	1,607

work still is by no means easy. The rural youth have a limited choice of occupations and insufficient opportunities for creative development. The fact that cooperative farms are engaged in many branches of agriculture hinders further industrialisation of crop farming and animal husbandry. The cost of agricultural produce remains virtually unchanged despite the steady annual increase of capital investment by the state.

These problems may be solved by making farm work a strictly specialised and highly mechanised branch of production run along industrial lines. The main directions of further agricultural development are specialisation and concentration of production.

Collective and state farms pool their funds to build industrialised livestock complexes and mixed-feed plants and to set up construction and land-improvement organisations, agrochemical centres, pedigree farms and so on. These joint projects are the property of the participating farms.

One successful form of agro-industrial integration is the collective-farm-factory and the state-farm-factory, which combine agricultural production with industrial processing.

There are now 9,000 inter-collective-farm, collective-and-state farm and other specialised inter-farm associations, organisations and enterprises producing meat, milk, feed, seeds, vegetables and building materials.

Town and village. Industrialisation of farm production, modern transport and construction facilities, trade and public catering, basic services and cultural benefits are increasingly reaching the countryside. Specialisation in agriculture leads to new directions of production and new occupations. The village begins to live and work at a faster rate, learning management techniques from the town. Town and village are steadily coming closer together in the decisive sphere of human activity: production.

Another aspect of this process is the further equalisation of the socio-economic conditions between town and country. In 1960 a farmer received on an average only half of an industrial worker's earnings, while today he gets as much as 87 per cent. Farmers' earnings are growing at a faster rate than those of industrial and office workers. The needs of the countryside in electricity have been fully met and those in natural gas, by 60 per cent.

Farmers receive free medical assistance at state-run establishments. Women farmers are given paid maternity leave. As a rule, agricultural workers spend their holidays and improve their health at sanatoria, rest homes and holiday hotels either free of charge or at reduced rates. They get sick-leave benefits and pensions.

Today, about 70 per cent of the people working in the countryside have either higher or secondary education.

Areas under crops (in million hectares)

Grain crops 126.4

Feed crops 67.3

Technical crops 14.4

Potatoes and other vegetables 9.2

Total: 217.3

Crop farming. The severe droughts of the early 1970s caused crop failures in many parts of the country in four out of five years. Yet there were no disastrous consequences. Even the smallest grain harvest of the last decade — 140 million tons in 1975 — was adequate for meeting the population's needs in bread and other baked products.

Grain is the backbone of agricultural production in the USSR. The reclamation of virgin and fallow lands in Kazakhstan, Siberia, the Volga region and in the Soviet Far East, which began in 1954, led to a rapid increase in grain production; 42 million hectares of land have been made arable. Today this land yields a quarter of the country's total grain output.

In order to fully solve the grain problem, zones are being created on irrigated lands in the Volga area, Southern Ukraine, North Caucasus and Kazakhstan where stable yields are guaranteed.

The USSR accounts for 13 per cent of the world's grain output, 900 kg per capita. This is more than twice the world average, but only two-thirds of that produced in the United States and one half of that produced in Canada.

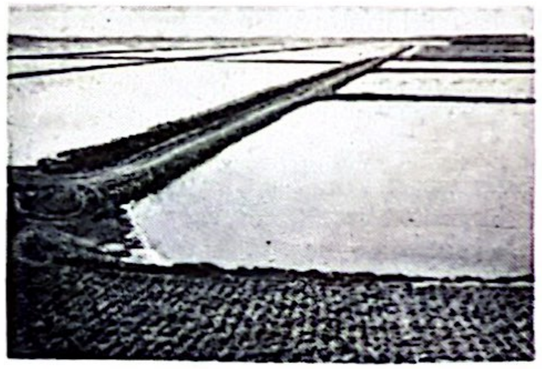
So far grain production falls short of requirements, which are growing faster than output. Over 50 per cent of the output is used for fodder, and the share of grain in animal feeds is growing and now stands at nearly 30 per cent. It is primarily the shortage of fodder grain that compels the country to resort to imports. Even with the best harvests of recent years (220-235 million tons a year) it is difficult to meet the needs of livestock farming fully, since over 100 million tons of grain a year is used to feed livestock and poultry.

Today, particular attention is given to raising the quality of food grain. The share of strong and hard varieties of **wheat** in the overall harvest is growing. These varieties have a higher-than-average protein content and are excellent for baking. The total area under wheat is 62 million hectares.

The area under **rye** is 9 million hectares. According to scientists, rye bread is more wholesome than bread made of wheat. And then there is Russian kvass (a tonic beverage made by fermenting rye). Recipes for it were known way back in early Russia.

Rice is mostly grown along the river Kuban. About 200,000 hectares of modern irrigation works have been built here for rice-growing. Its efficient production is made possible by

Rice fields in the Krasnodar Territory



thousands of kilometres of irrigation canals, elaborate networks of motor roads and power transmission lines and capital hydro-engineering structures of reinforced concrete. Computers, assisted by automatic and remote-control devices, distribute irrigation water among rice plantations. This technique is being adopted all over the rice-growing area on the Kuban. Average yields here are five tons of rice per hectare, though some farms take in up to 14 tons per hectare, despite the fact that the climate is insufficiently warm for the raising of this crop.

In 1979, for the first time, a new cereal called **tritikale** was sown over large areas of the Ukraine. This has been called the grain of the future. It was developed with the help of chromosome engineering by Andrei Shulyndin, a Ukrainian scientist. By splitting the nuclei of the cells of wheat and rye, he managed to develop a new kind of plant. Tritikale has the high-quality grain of wheat and the resistance to frost, drought, wind, disease and pests of rye.

There are more than 30 kinds of **industrial crops** grown in the Soviet Union.

In olden days it was only in Russia that they knew how to make the finest linen out of **flax.** Appropriately, it was dubbed abroad "Russian silk". The manufacture of linen was so profitable that it was forbidden to take flax seeds out of Russia for sowing. They were only sold abroad in a baked form, for making linseed oil. Russian flax is still in demand and it is sometimes priced higher than wool on the world market.

The sunflower was first brought to Europe by the Spaniards in 1510. Oil was pressed from its seeds for the first time in 1829 by a Russian serf named Daniil Bokarev. The tools he used, an oak stump with a hollow, a mallet and wedges, are preserved at the museum in Alexeyevka, Belgorod Region. The original oil-mill, now 150 years old, is today part of the local food factory.

The area under sunflower today exceeds 4.5 million hectares. Soviet selectionists have developed high-yield varieties of sunflower with an oil content of up to 50 per cent as against the usual 25 per cent.

The total area under orchards, berry plantations and vineyards has reached five million hectares.

Livestock farming. Special attention is given to feed production, which has become a specialised branch of the economy, and to raising the level of mechanisation of livestock farming so as to increase meat output.

Soviet Central Asia, the home of **astrakhan,** still has the largest population of karakul sheep (12 million) and its astrakhan skins are still of the highest quality and produced in the largest quantity. In Kazakhstan the population of karakul sheep has reached five million and there is an Institute of Karakul Sheep Breeding and a factory for processing astrakhan

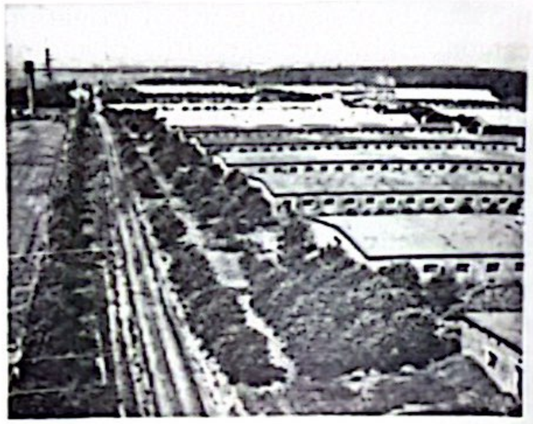
Output of farm crops (annual average in million tons)

	1966-1970	1971-1975	1978	1979	1980
Grain	167.6	181.6	237.4	179.0	189.2
Raw cotton	6.1	7.7	8.5	9.2	9.9
Sugar beet	81.1	76.0	93.5	76.0	79.6
Sunflower	6.4	6.0	5.3	5.4	4.7
Potatoes	94.8	89.8	86.1	90.3	66.9
Other vegetables	19.5	23.0	27.9	25.8	25.9

skins (the coats of newborn lambs). Kazakh selectionists have created astrakhan of various patterns and colours.

Dark-grey astrakhan is in vogue today, but even more so is the *sur* type iridescent astrakhan. Each hair is dark at the root and light at the tip, and this creates rippling tints. Nearly one half of the country's 260 karakul sheep breeding state farms specialise in this kind of astrakhan.

Poultry farming. Chickens account for the largest share—more than 80 per cent—of the poultry population of 881 million, and geese, the second largest share. The number of ducks, turkeys and guinea fowls is much smaller than in Western Europe. Poultry farming has been placed on an industrial basis. The problem of supplying enough eggs for the population has mainly been solved, but the supply of poultry meat is still insufficient.



Livestock complex at a collective farm near Lvov

Mariculture is a new term denoting the raising of salt-water fish, shell-fish, shrimps, crabs, octopuses, and algae. The resulting harvest is 5,000 (!) times greater than the usual catch on the high seas. One hectare of a marine farm yields up to 80 tons of fish and 120 tons of mussel meat a year. Trepang and scallop are grown in Pacific waters, while on the Sea of Azov and the Baltic Sea many collective farms breed rainbow trout and bester, a cross between beluga and sterlet. The fish breeders of Magadan have created an artificial spawning ground for herring in the Sea of Okhotsk.

Animal husbandry
(in million head)

	1976	1977	1978	1979	1980
Cattle, including cows	110.3	112.7	114.1	115.0	115.5
	42.0	42.6	43.0	43.3	43.4
Pigs	63.1	70.5	73.5	73.7	73.5
Sheep and goats	145.3	146.6	148.1	149.2	147.0

Output of livestock products
(annual average)

	1966-1970	1971-1975	1980	1985 (target)
Meat (slaughter weight, mln. t.)	11.6	14.0	15.1	17-17.5
Milk (mln. t.)	80.6	87.4	90.7	97-99
Eggs (thou. mln.)	35.8	51.4	43.1	72
Wool (thou. t.)	398	442.1	461.7	470-480

BYELARUS ON THE WORLD MARKET

Soviet "Byelarus" tractors in Afghanistan

Soviet tractors are in ever growing demand on the world market. Here is what foreign buyers have to say about them:

Darris Muller, an American farmer:
"Its hydraulics use cheap brake fluid and the motor can take inexpensive lubricating oil."

Robert Keburn, Northern Ireland:
"They have reliable engines."

Jack Wilkinson, Managing Director of the British UMO:
"Soviet tractors are doing fine on the British market and the reason is their high quality."

S. V. Ling, President of Min Sen Machinery Co. Ltd., Thailand:
"Our farmers have found the Byelarus tractors to be highly efficient and well adapted for work in a tropical climate."

Transport

The Soviet Government has always made the development of public transport a high priority. The privately-owned car is not to replace public transport but to supplement it. In Moscow alone, all types of city transport can carry at the same time over 1.5 million passengers, or the entire population of a big city, while motor transport alone carries more than 15 million every day.

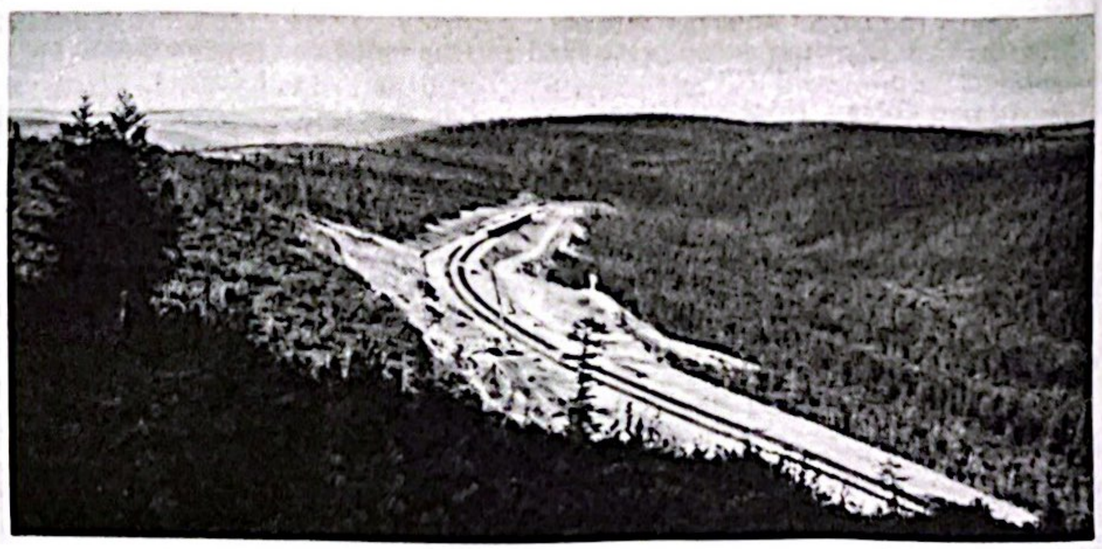
Motor transport. Buses are the number one public conveyance. Each year intercity buses carry more than 40,000 million passengers—three times as many as the railways and 100 times as many as the airlines.

Railways. The USSR has more than 140,000 km of railways, which is one-tenth of the world's total. Forty thousand kilometres of railways are electrified. Soviet railways account for more than half of the world's total rail freight traffic.

Most railways are being built in the newly developed areas of Siberia, Kazakhstan and Soviet Central Asia. One of the key projects is the Baikal-Amur Railway (BAM) which will link Ust-Kut with Komsomolsk-on-Amur, a distance of 3,200 km. More than half of the track has already been laid. Running to the north of the Trans-Siberian railway, the Baikal-Amur Railway will make available the rich energy and raw material resources of the less accessible areas of Siberia and the Soviet Far East covering 1,500,000 sq.km. Coal of Southern Yakutia, copper of Udokan, iron ore and mica of the Aldan province, asbestos of the Molodezhny deposit, timber of the Amur and Lena taiga—these and other yet untapped natural resources are for the time being only marks on economic-and-geographical maps. Now the task has been set—to utilize the hitherto hardly accessible mineral and raw material resources for further building up the national economy and to develop this remote and so far thinly populated region.

More underground railways are being built in Moscow, Leningrad, Kharkov, Kiev, Baku, Tbilisi and Tashkent. In 1980 an underground railway was opened in Yerevan. Minsk, Novosibirsk, Gorky, Kuibyshev, Sverdlovsk, and Omsk will soon have underground railways, and plans have been made to build an underground in Riga and Rostov-on-Don. Engineers and workers from Moscow have helped to build and run underground railways in Prague,

The Baikal-Amur Railway (BAM) passes through the Yakut Autonomous Republic



Budapest, Zagreb, Sofia, Helsinki, Marseilles and Calcutta.

Moscow's underground (the Metro), which has 114 stations in its 194-km network, carries some 7,000,000 passengers every day, or over 2,000 million in a year.

The Soviet **merchant marine** stands sixth for tonnage—16.5 million register tons, and second for the number of ships—nearly 2,000 ships including fishing vessels. Soviet ships call at 1,500 ports in 125 countries.

Air transport. Soviet air routes total 900,000 km, 370,000 km of which are international. Aeroflot, the Soviet airlines, flies to 84 countries and carries more than 100 million passengers and up to three million tons of cargo and mail annually.

Every fifth air passenger in the world flies on a Soviet plane. On some routes air transport handles as many passengers and as much cargo as do the railways—only much faster. In tourist season up to 40 planes a day fly from the Soviet Union to Bulgaria, for instance.

Aeroflot services geologists, oil workers and builders. It is common to see a heavy helicopter airlifting a derrick or delivering heavy pipes for a new pipeline. Aircraft flying over forests and fields cover an area of up to 100 million hectares a year, detecting forest fires and hepling fishermen locate shoals of fish.

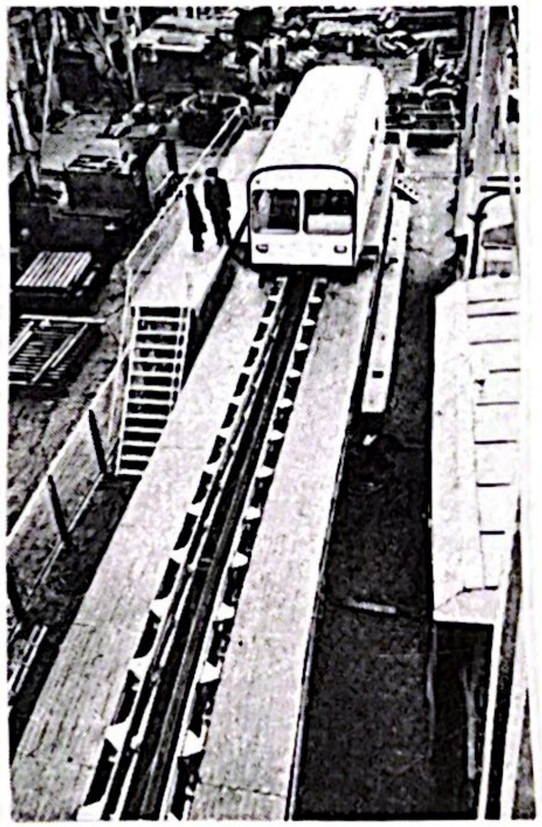
The longest non-stop route between Moscow and Petropavlovsk-Kamchatski has been opened. Flight aboard *IL 62M* lasts 8 hours 30 minutes; so with the 9-hour difference a passenger leaving Kamchatka arrives in the capital half an hour "earlier".

Hydrotransport. A coal pipeline from the Kuznetsk basin in Siberia to Novosibirsk will be built. The line by which water coal suspension will be transported to a thermal power station will be 250 km long.

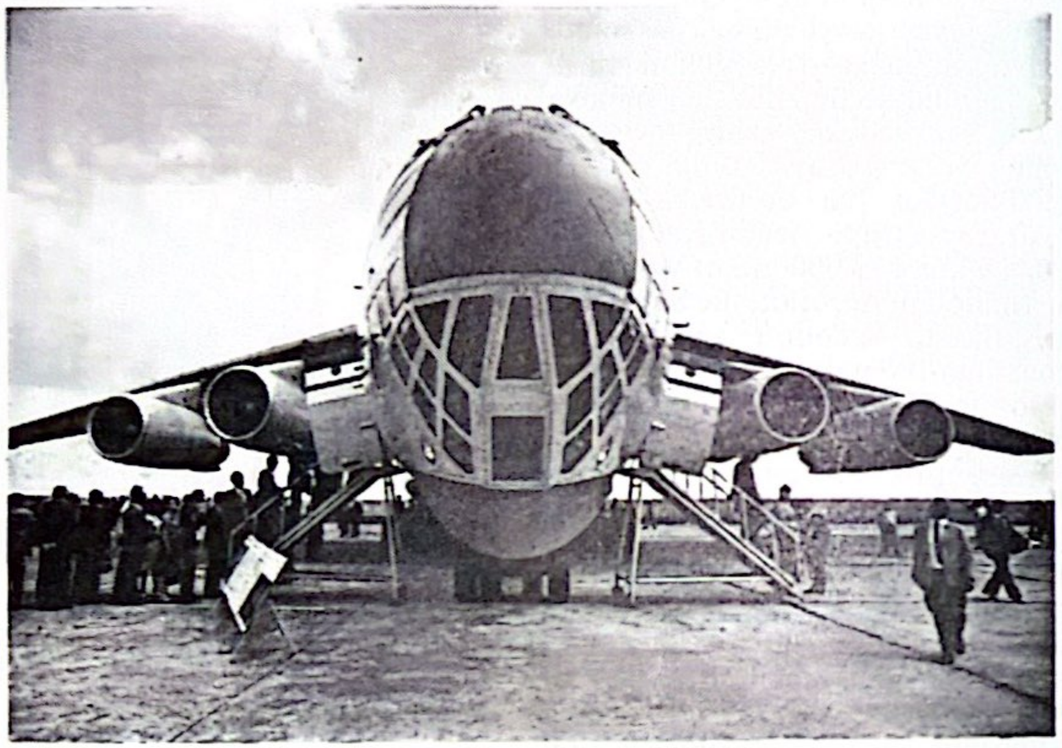
Electric magnetic transport. A magnetic suspension railway carriage has been successfully tested.

Metro station in Baku

Testing a magnetic suspension railway carriage



IL-86 AIRBUS



This new Aeroflot plane looks twice the size of even the IL-62 intercontinental liner. Carrying 350 passengers, it really does do the work of two or three ordinary planes. There are 12 air hostesses on board but the crew consists of only two pilots and a flight engineer. The work of the crew is made much easier by the extremely sophisticated equipment which includes a navigational display with a screen on which a luminous line indicates the route, as well as a flight-controlling computer.

Despite its impressive size the IL-86 does not require a very long air strip. Safety is ensured by a modern wing design and a novel undercarriage system which reduces the load on the landing strip. All the vital systems are quadrupled.

Foreign Economic Ties

The Soviet economy is becoming increasingly involved in international division of labour, and Soviet foreign economic ties are acquiring a long-term character. The number of the Soviet Union's trading partners has grown and is now close to 130.

Foreign trade (in thousand million roubles)

1950	1960	1970	1977	1978	1979	1980
3	10	22	63	70	80	92

Socialist countries are the Soviet Union's main trading partners.

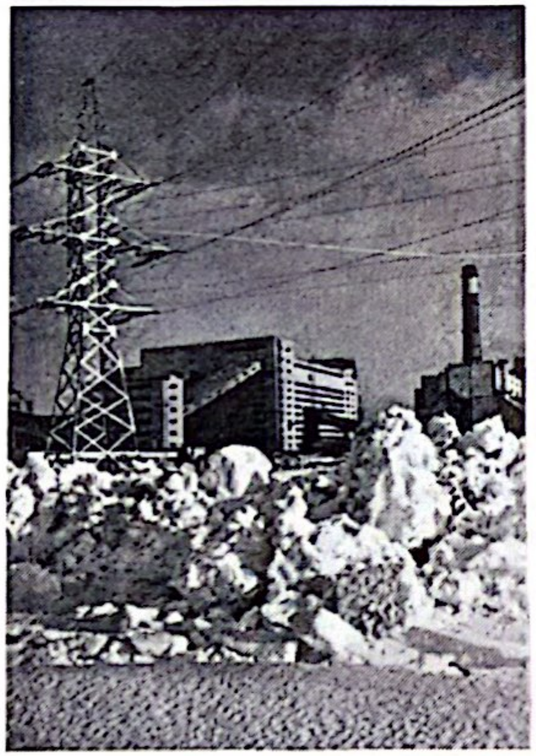
The Council for Mutual Economic Assistance (CMEA) is a collective organisation of socialist countries which meets both the international and national interests of the fraternal countries. It includes ten states in Europe, Asia and America with a total population of over 430 million. Accounting for 19 per cent of the territory and 10 per cent of the population of the world these states are responsible for nearly one-third of the world's industrial output and more than a half of the world's industrial increment.

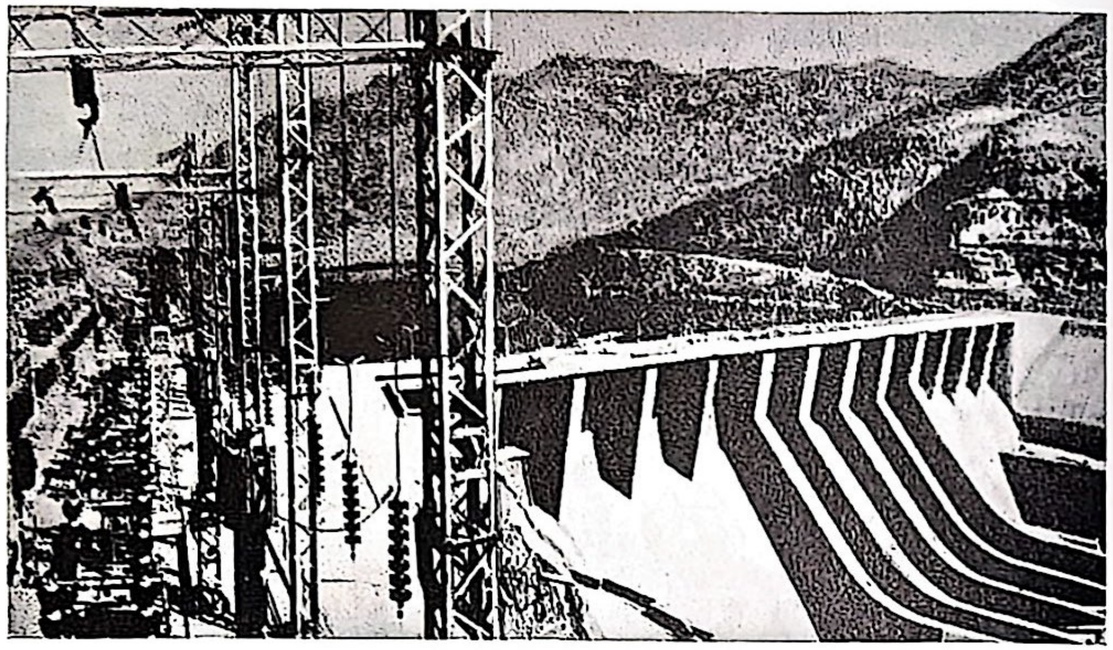
Cooperation between these countries is not confined to the development of trade. They jointly develop natural resources, build industrial complexes, and organise cooperation between enterprises and whole branches of industry.

A super-powerful electricity transmission line starts in the Ukrainian town of Vinnitsa, crosses the border and ends in Hungary, "closing" the ring of power supply systems of the socialist countries. Regular ferries connect the ports of Ilyichevsk and Varna on the Black Sea. In Czechoslovakia a turbine for an atomic power station built with Soviet assistance is put into operation. A 1,750 km gas pipeline "Soyuz" stretching from Orenburg to the western frontier of the USSR was commissioned in 1980. The Ust-Ilimsk cellulose factory and the Kiembaev asbestos ore-concentration mill, built jointly by CMEA countries, have started production. New capacities to put out nickel-cobalt products are being built in Cuba. The production of bauxites is to be started by the enterprises now under construction in Hungary. Joint geological survey teams are working in Mongolia.

Various scientific and technological problems are being solved jointly, especially those concerned with raw materials, fuel and power supply, agriculture and the food industry, mechanical engineering, consumer goods

The Kiembaev asbestos mill near Orenburg is a joint project of socialist member-countries of the Council for Mutual Economic Assistance





The hydropower station in Naglu is a joint Soviet-Afghan project

industry and transport. More than 14,000 studies in the field of fundamental and applied science have been completed within the CMEA framework.

In response to a request by the government of the People's Democratic Republic of Yemen the 33rd session of the CMEA decided to accept Yemen into the CMEA in the capacity of an observer. The observer status is also extended to the Korean People's Democratic Republic, Angola, Laos and Ethiopia. Yugoslavia takes part in the work of the CMEA too. Iraq, Mexico and Finland cooperate with the CMEA on the basis of agreements.

The Soviet Union trades with 86 **developing countries.** The trade pattern with this group of countries is largely determined by their need for economic and technical assistance in building industrial, power, transport and other projects and for long-term credits on favourable terms. In repayment of loans these countries deliver to the Soviet Union their traditional export goods and goods produced at enterprises built with Soviet assistance.

Industrial plant and equipment for projects under construction make up 50 per cent of Soviet exports of machinery and equipment to developing countries. More than 70 per cent of Soviet economic and technical assistance to these countries goes to industry.

Of special importance in solving the problem of industrialisation of the developing countries is assistance in building large power projects which form the power base in these countries. Electric power stations built with Soviet assistance generate over 80 per cent of electric power in Syria, 60 per cent in Afghanistan, 50 per cent in Egypt, 30 per cent in Morocco, and nearly 20 per cent in India, Iraq and Bangladesh.

The Soviet Union also helps developing countries build their own iron-and-steel industry. Metallurgical plants have been designed and equipped with Soviet assistance in India, Egypt, Iran, Turkey and Algeria. Big iron-and-steel works are being built in Nigeria. The construction of big blast furnaces has been completed in India, Iran, Turkey and Egypt.

India is an important trading partner of the USSR. Among its state-owned enterprises the most efficient are those built with Soviet assistance. They provided jobs for more than 140,000 people.

The USSR is helping Afghanistan in building up the latter's public sector. Gas fields, a nitric fertiliser factory, several electric power stations, a house-building complex and other enterprises have been built in Afghanistan on the basis of Soviet-Afghan cooperation.

The Soviet Union helps developing countries to establish control over their natural resources. It also assists in training national personnel. The Soviet Union builds for them schools and colleges. Nearly 80,000 young people from developing countries are enrolled in Soviet educational institutions or receive practical training at Soviet industrial enterprises every year.

Western countries now account for one-third of the Soviet Union's foreign trade turnover. In recent years there has been a definite change in attitude among the industrial capitalist countries towards economic cooperation with the Soviet Union based on the principle of mutual advantage; such cooperation takes the form of long-term treaties and agreements and large-scale transactions between Soviet organisations and foreign firms. Long-term agreements, mostly covering a period of ten or more years, have been signed by the USSR with Finland, France, Austria, the FRG, Great Britain, Italy, Sweden, Belgium and Denmark.

Transportation of Soviet natural gas to France via a 3,000 km pipeline running through the territories of Austria and the FRG started in 1980. Electricity transmission lines are being constructed to connect the USSR with Finland and Austria. These lines will probably be extended further to the west.

The Soviet Union has concluded agreements and contracts with Western countries, on a compensation basis, for the construction of more than 60 projects. For instance, French, Swedish and Finnish firms delivered equipment for the Ust-Ilimsk timber combine and the Soviet Union pays for these deliveries with pulp produced by the combine. The Soviet Union and the US firm, Occidental Petroleum Corporation, have signed an agreement on the building in the USSR of a large industrial complex for the production of mineral fertilisers. Under the agreements and contracts that have been signed, the French company Rhône-Poulenc will take part in the construction in the USSR of several chemical plants, and West German companies in the building of the Oskol electrometallurgical plant.

Italian and British companies will supply material and equipment for chemical plants. Japanese companies will help to develop the South-Yakutian coal basin.

Soviet organisations in their turn are taking part in building various projects in France, Finland, Canada, Norway, Greece and other Western countries. In France Soviet enterprises are helping to build an iron-and-steel complex in Fos-sur-Mer near Marseilles and to build new oil refineries and enlarge the capacities of existing oil refineries near Bordeaux.

Nearly 650 French companies maintain business contacts with the USSR. Today one can see metal-cutting lathes, forge-and-press equipment and automatic assembly lines with the stamp "Made in the USSR" at the Creusot-Loire, Renault, Chausson, Alsthom and other factories.

Engineers and scientists of the two countries cooperate in solving the most complicated technological and production problems. Thus, the *Uralmash* machine-building factory in Sverdlovsk and the French company Poclain are working jointly to

French specialists help Soviet colleagues set up a computer "Sabre" in Yuzhno-Sakhalinsk

produce the world's biggest hydraulic excavator. Nearly 10 per cent of French workers in mechanical engineering alone are employed on jobs related to filling Soviet orders.

There are lively scientific and technical contacts between France and the USSR in various fields ranging from space physics, nuclear power engineering, astronomy and physics of the Sun to horticulture and wine-making. In the field of peaceful uses of atomic energy the main trends of cooperation are the development of fast-neutron reactors, controlled thermonuclear fusion and plasma physics.

The Soviet Union is a major buyer of machinery and equipment for the chemical and timber industries, for motor vehicle factories and enterprises of light industry and the food industry. The USSR exports to the industrial capitalist countries oil and oil products, metal-cutting lathes, bearings, excavators, tractors, motor vehicles, aircraft, ships and other machines. The Soviet Union is also an exporter of clocks and watches, cameras, radios, TV sets and other household appliances.

Soviet exports of licenses to Western countries for the manufacture of Soviet-designed industiral goods and modern technological processes have gone up. The United States alone has of late bought scores of Soviet licenses. Soviet know-how in welding, steel-smelting, non-ferrous metal making, coal extraction and several other industries is used by the United States, Federal Germany and Japan. Nearly 20,000 Soviet patents are being used abroad, and more patent applications are under consideration which, upon approval, will provide legal protection to original scientific and technical solutions developed in the USSR (which account for 20 per cent of the world's total).

A new trend is cooperation between Soviet organisations and Western firms which often leads to joint inventions. Cooperation with the Belgian company Union Chimique Belge has resulted in 12 Soviet-Belgian patents. New types of machine tools have been designed jointly with the West German firm Gildemeister. A Soviet-French license for making isoprene is being used in Japan.

Education

About 100 million people studied in the 1979-1980 academic year at secondary schools, vocational training and specialised secondary schools, institutions of higher learning and at special courses at factories and other establishments for occupational retraining and upgrading skills. This is perfectly natural. As their level of education grows people become more active socially. Running the affairs of factories, organisations and the country as a whole must be the concern of everyone. This is becoming more complicated and requires an increasingly higher level of professional skill and general cultural standards.

The proportion of students in the population has increased, an indication of the growing thirst for knowledge. But this also raises problems.

Education has been and remains free for everyone. But it becomes ever more expensive for society. Expenditure on general school education is growing: teachers' salaries are increasing, their conditions of work are improving, and classrooms and gyms facilities are getting better. Textbooks for junior grades are now provided free.

Lesson at a construction technical school in Volgograd

Schools and classes where pupils study certain subjects and various types of occupation, the arts and sports in greater depth, both theoretically and practically, have been set up for developing the interests and abilities of schoolchildren and for vocational guidance. The number of special schools with emphasis on physics, mathematics, foreign languages, the arts and so on is growing.

True, the total number of schools is decreasing. Back in 1930 universal primary education was introduced and in 1958—compulsory eight-year education which in 1975 was raised to ten years. Gradually schools merged to form ten-year secondary schools, which are now in the majority.

It sometimes happens that boys and girls start work before they complete secondary education. But when they come face to face with the high demands of modern production they discover that their knowledge is not sufficient and they have to continue their studies.

One of the forms of secondary education is **schools for young workers** of which there are 14,000 with a total enrolment of about five million people from 16 to 30. There are also older people attending such schools, who have seen much and have considerable work experience.

The regimes in such schools are very diverse: study may be conducted by correspondence, in morning, daytime or evening classes or even at different hours on different days. Students are

Enrolment at educational establishments (in millions)	1965-1966	1977-1978		1978-1979	1979-1980	1980-1981
	48.3	45.4	General education schools	44.7	44.4	44.3
	3.7	4.7	Specialised secondarschools	4.7	4.6	4.6
	1.7	3.7	Vocational schools	3.8	3.9	4.0
	3.9	5.0	Higher education establishments	5.1	5.2	5.2
	14.3	36.1	Skill-upgrading courses	39.8	40.2	42.1
	71.9	94.9	Total:	98.1	98.3	100.2

helped by tutors and provided with special literature. The management of enterprises is obliged by law not to put workers who attend such schools on evening and night shifts and to give them holidays with full pay for taking examinations.

Recently many schools for young workers have set up day-release courses: one day a week, instead of going to work they attend lessons in the form of lectures and tests, and receive one half of their wages for that day.

Over one million young people finish the schools for young workers every year.

A university or college does not seek to teach students as many subjects as possible. Its main purpose is to give the students a profound knowledge in fundamental sciences which become outdated much more slowly than practical disciplines. On the other hand, it teaches the students how to apply their knowledge in practice, developing the young person's powers of creative thinking and directing them towards solving specific problems. Therefore, the syllabuses of universities and colleges now include scientific and technical creative work which goes far beyond purely educational needs.

About one half of the country's scientists work at higher educational establishments and students are engaged in research under their guidance. About one million of them take part in student scientific societies and design bureaus. Student research work has become part of the educational process and is compulsory. A student who has not conducted a serious piece of research does not receive a diploma.

Student associations such as design bureaus or teams, working on their own initiative at various projects during the summer vacations, frequently conclude contracts with factories or other organisations for developing specific projects whose results are later applied in production.

As a result, long before graduation students are given a taste of modern

Members of the design bureau at the Lvov Polytechnical Institute

industry and can gear their scientific training to it. This is especially important since many graduates come to work at the factory or research institution where they made a good showing during their practical training.

Teaching tactics are determined by strategy, based on the long-term trends. Let us take, for example, structural changes in the economy. At present agriculture with its growing productivity requires much less manpower resources than before, so there is a shift to industry. The manpower resources released from production are transferred to the non-productive sphere. Redistribution is taking place in individual sectors as some trades are born and others die. Modernisation and changes in technology are such that knowledge once acquired is no longer sufficient for a whole lifetime. This knowledge must be regularly updated and so graduates are aware of the need to study constantly.

The problem of the quality not only of training but of retraining as well has come to the fore: graduates are becoming permanent students, as it were. Out of the 98 million of those who study, over 37 million are mastering new professions and trades after technical school or college and are upgrading their skill at factories and enterprises. People's universities occupy an increasingly important place in this system of education for the educated. There are 40,000 such universities with a total enrolment of ten million, more than twice that of conventional establishments of higher education.

The volume of knowledge is snowballing. Does it mean then that narrow specialisation inevitable? This is fraught with the danger of producing highly educated ignoramuses who know everything about a narrow subject. In addition, the integration of knowledge is taking place (e.g. mathematical linguistics, ecology, etc.). It is

Display class at the Moscow Institute of Engineering Physics

being acknowledged in ever widening circles that the future belongs to versatile specialists whose training combines traditional learning, the development of a world outlook, a moral and esthetic make-up, participation in social life, and amateur arts and sports activities. In nurturing all of a person's abilities, the education system is aimed at an all-round, harmonious development, both cultural and physical, of the personality. It implements these principles everywhere for it has become all-embracing and universally accessible.

There are 70,000 foreign students from 139 countries studying at higher and specialised secondary educational establishments. Their curricula are drawn up so as to take into account the conditions in which the students will later work. All the 300 Soviet educational institutions in which foreigners study maintain contact with their graduates. Courses for upgrading skills and traineeship courses are organised for them where they can get acquainted with the latest developments in their chosen field.

PEOPLE'S FRIENDSHIP UNIVERSITY

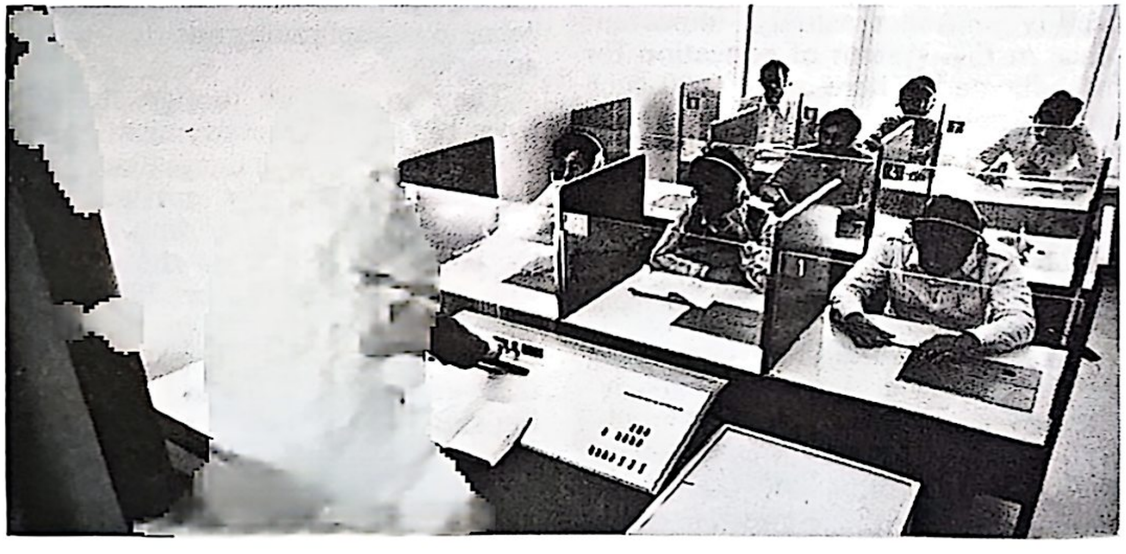
Before becoming full students at the People's Friendship University in Moscow, named the Patrice Lumumba University after the Congolese national hero, young men and women from almost all the developing countries study Russian in the university's Preparatory Department—the rapid course designed for those who don't know a word of Russian and which is called the "zero" course. In a year students learn enough Russian to speak it, read it and understand lectures. They then feel themselves part of the multinational student body of 6,700. In the 20 years of its existence more than 8,000 doctors, agronomists, geologists, builders and specialists in other lines, for whom there is a great need in countries striving to achieve economic independence, have graduated from the university.

Foreign students enjoy the same rights and have the same obligations as Soviet students, but being away from home they receive larger grants. They can also earn some money during their vacations, when they can go to student country camps to help get in the fruit and vegetable harvest. They can earn even more if they join one of the student building teams that go out to youth construction sites every summer. There the future specialists have a real opportunity to learn the art of management. Yet it is still possible to have enough time to go for a holiday to the university rest home on the Black Sea coast, to tour the USSR or even go home for a visit.

Studies are combined with research work, the results of which are reported at scientific conferences. The more interesting papers are published and submitted to contests for students' scientific papers. Ruben Ramos, of Mexico, was the winner in the contest for medical studies and Kenyan student Michael Mwamba won the social sciences contest.

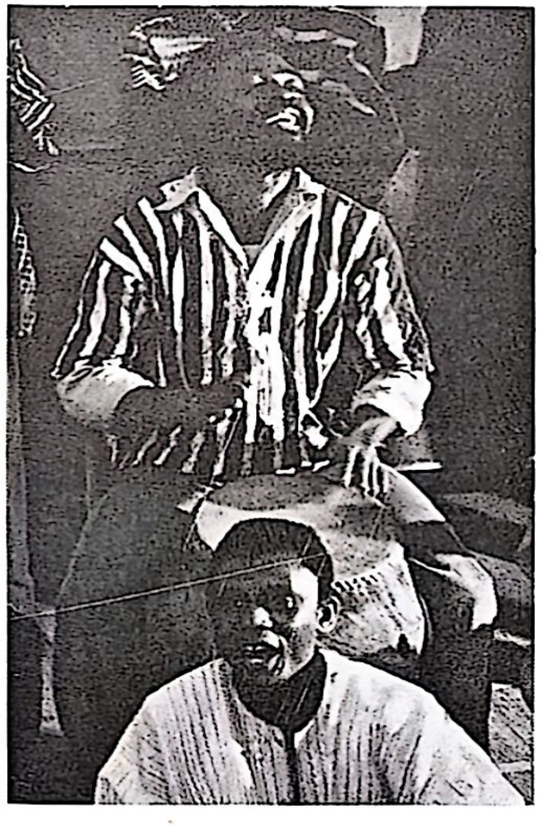
Even before receiving their graduation diploma students have important scientific achievements to their credit. Mary Gachigi, of Kenya, made a successful attempt to domesticate African antelope during field training at the Askania-Nova reserve in the South of the Soviet Union. After graduation she set up a farm for these animals at home. Jayant Honmode, of India, managed to crossbreed coarse-haired Indian sheep with Soviet fine-fleeced sheep to obtain an entirely new breed. For this work he received the degree of Doctor of Biology. Ratanasara Pallekande, of Sri Lanka, former Buddhist lama, compiled a 20,000-word Russian-Singalese dictionary. Mohammed Shaddad, of the Sudan, found

In a language study room



Wedding in a student hostel: the newly-weds are young people from Bangladesh

Ghanaian students take part in most amateur art activities



one of the Sudan's biggest deposits of chromites.

There is no "brain drain" through the People's Friendship University: all graduates go to work in their home countries. Besides acquiring a profession, many of them learn managerial skills and become production managers or economic executives. For instance, Subarna Thapa, of Nepal, is director of an oil company, Guinean Cabine Cante is general director of the board of the bauxite deposits of Kindia, and Humberto Sosa, of Ecuador, set up a mining academy of which he is now rector. Keita Founeké, of Mali, Hari Chetri, of Nepal, Samba Mané, of Guinea-Bissau, and Mahmoud Nagashi, of the People's Democratic Republic of Yemen, are ministers in their countries' governments.

Final-year students choose for their graduation theses problems which can contribute to their own countries' economic and cultural advance. A group of future town planners for Sri Lanka drew up a plan for the reconstruction of Colombo and a student from the Ivory Coast developed a fertiliser compound for soya beans, the cultivation of which has just begun in his country. How highly such devoted work is appreciated in the developing countries may be seen from this letter which doctor Sara Orellano, former Friendship University student, wrote from Honduras.

"Last night I was woken up by a serenade. I looked out of the window and saw a crowd of peasants with flutes and guitars. They were singing for me and then there was a firework display in my honour. My heart was filled with joy. This joy I owe to you, my Soviet teachers."

In the medical department

Living Standards

The fact that there is no private ownership of the means of production makes it possible to distribute the national income evenly and on a just basis among all who create it. Three-quarters of it are used for personal consumption, that is to say, to provide material benefits and services for the population.

But if we take into account the fact that everyone receives or can receive an apartment from the state and that the cost of medical treatment, education and other social and cultural needs are met by the state, then the total sum spent on raising living standards will come to something like four-fifths of the national income.

Employment and wages. It is mainly through wages and salaries that the cash incomes of the working people are increasing. The state guarantees full employment of all able-bodied people and remuneration for their labour according to the quantity and quality of work done but not below the minimum rate fixed by the state.

Between 1976 and 1980, 31 million people or one-third of the gainfully employed population had their salaries and wages raised by 20 per cent. This is quite a sizable increase considering the stability of prices. During the eleventh five-year period the wages and salaries will go up by another 13 to 16 per cent while the collective farmers' incomes will grow by 20 to 22 per cent.

Taxes from the population make up no more than 8 or 9 per cent of the revenue in the state budget and are gradually being abolished. Taxes now come to 8.6 per cent of the budget of the average worker's family.

The rate of income tax ranges from 0.7 to 13 per cent.

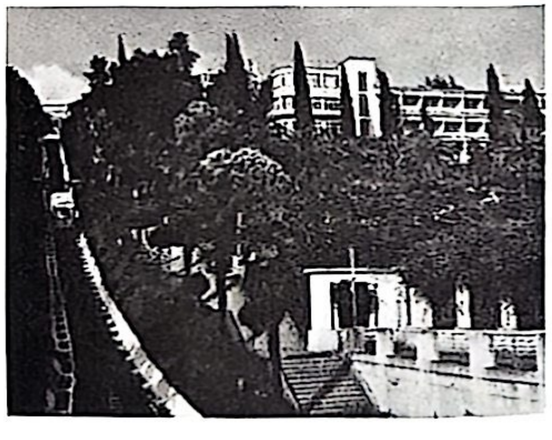
Those who own a house pay a yearly tax which is not above one per cent of its cost. Owners of motor vehicles and country houses also pay a small charge. For example, the owner of a *Lada* or *Moskvich* car is charged 14 or 15 roubles a year and the owner of a country house pays up to 20 roubles a year.

Public consumption funds are that part of the national income which the population receives in the form of free material and cultural benefits, and also in cash as an addition to their earnings. They are made up of deductions from the profits of plants, factories, mines, shops, agricultural and other enterprises as well as of allocations from the state social insurance budget controlled by the trade unions.

Due to differences in the nature of work done and in people's abilities and qualifications, earnings and, consequently, spending levels differ. The level of spending is naturally lower in families with lower incomes or with more dependents. The public consumption funds ensure that all citizens have equal material opportunities in education, production training, medical treatment and so on.

Almost half the expenditure from public consumption funds is on free education, medical care, on maintaining sanatoriums and health resorts and on cultural and physical education. About forty per cent is used on maintaining the disabled and from 10 to 12 per cent on providing holidays with pay.

Sanatorium in Sochi



The public consumption funds add 25 to 30 per cent to a family's real income.

Prices are fixed by the state jointly with the trade unions. When it reduces the prices of certain commodities, such as children's goods, medicines, textbooks and school supplies, and commodities that make life better and easier, even to a level below production costs, the state gives subsidies to the producers to cover their losses. At the same time, by raising the prices of goods that are injurious to health, such as tobacco, it restricts their consumption. Higher prices are fixed for several commodities output of which cannot be increased and which are not items of prime necessity, such as red and black caviar, rare varieties of fish, and valuable furs, including sable, mink and ermine.

Many foodstuffs are sold at retail prices which are lower than cost price. For example, shops sell beef at half the price that its purchase, processing and handling cost the state. The state also pays more than the consumer for dairy products, potatoes and other vegetables. And yet the state purchasing prices of certain kinds of agricultural produce are still insufficient to repay the cost to collective and state farms. To make them interested in expanding production and to make this production profitable, state purchasing prices were raised in 1979 for milk, wool, karakul skins, mutton, potatoes and some other vegetables. The retail prices of these goods remained unchanged.

Fixed retail prices guarantee the stability of the purchasing power of money. Prices do not depend on the year's harvest or on price fluctuations on the world market. The state takes care of all unfavourable market fluctuations.

The prices of bread and cereals have remained unchanged for more than 20 years now. Sugar has been sold at the same price since 1962 when it was reduced. The prices of milk and meat have also remained stable since then. Footwear and cotton fabrics cost as much today as they did twenty-five years ago. The price of woollen fabrics was reduced in 1965. Ninety-nine per cent of foodstuffs and more than 90 per cent of other consumer goods are sold at the prices of 1970.

In the past few years there have been numerous reductions in the price of mass consumer goods. At the same time several commodities which are not items of prime necessity, such as gold and platinum jewelry, petrol, furniture, furs, carpets, cars and certain alcoholic drinks, have been made more expensive.

The retail price index has remained stable on the whole in the last decade, while that of manufactured goods has somewhat fallen. The sugnificance, volume and cash value of the goods for which prices have been lowered by far exceed that of the goods for which prices have been raised.

Market place in Moscow

KAZAKH SOVIET SOCIALIST REPUBLIC

Area—2,717,000 sq. km
Population—14,700,000
Capital—Alma-Ata
(population 910,000)

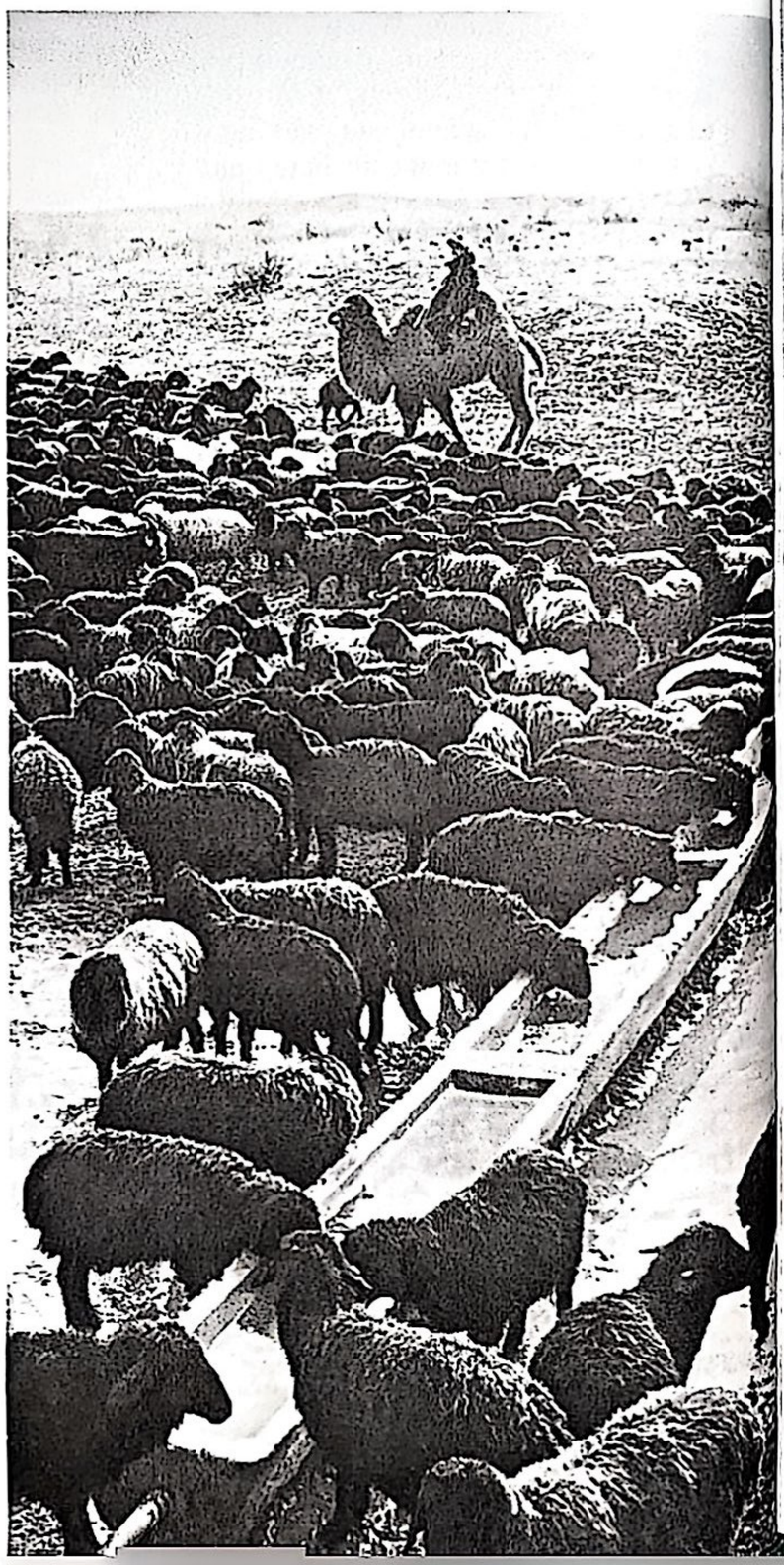
Kazakhstan, a land of wheat fields and grazing grounds, has made a big headway in its industrial development. Today it is the home of the Baikonur cosmodrome from which Soviet spaceships are launched, the Temirtau metallurgical giant with its huge blast furnaces, the Mangyshlak oil fields, and the Karaganda, Ust-Kamenogorsk and Dzhezkazgan mammoths of ferrous and non-ferrous metallurgy.

More than 25 million hectares of land was reclaimed in the republic in 1954, and the best wheat varieties that are rich in gluten and protein are grown here. Bread made of flour with a 20 per cent admixture of this protein-rich flour is crisper and tastier. In bumper crop years Kazakhstan accounts for 20 per cent of the country's total grain harvest, which is exactly what is needed to provide everyone with the best kind of bread.

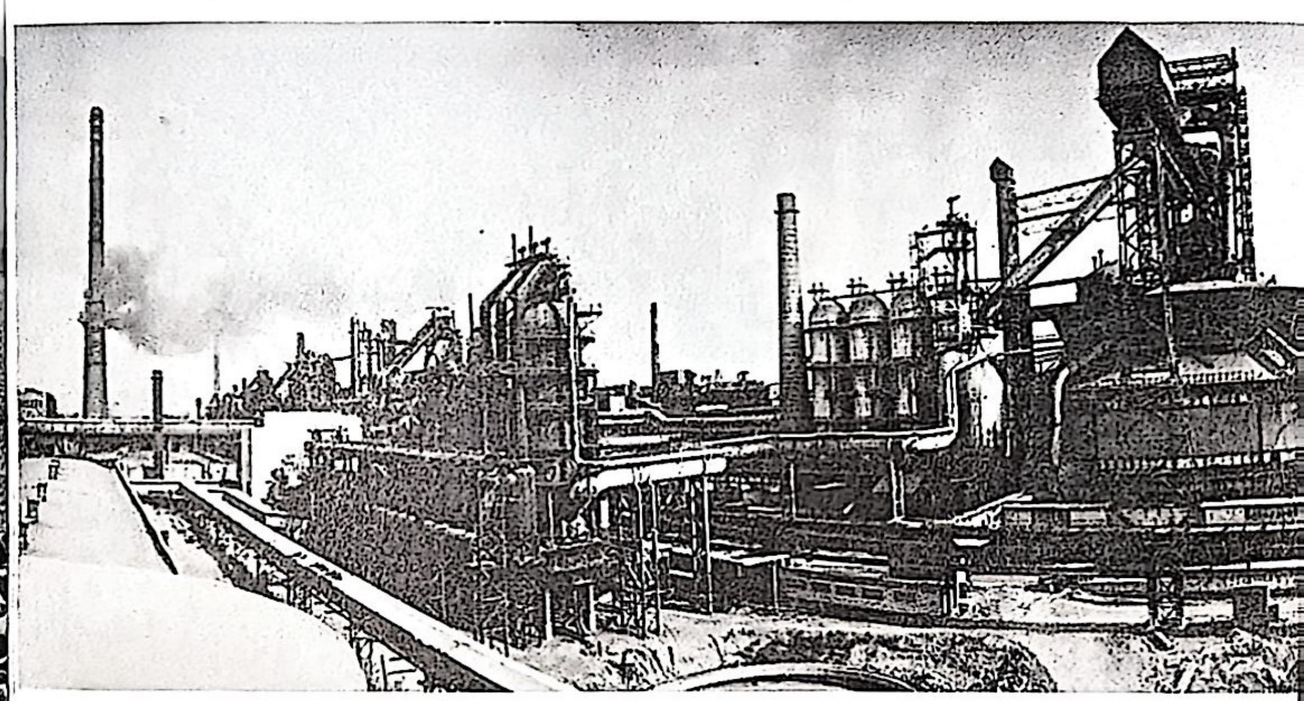
Livestock breeding is being placed on an industrial basis. Special sheep-breeding complexes for 25 to 30 thousand head of sheep have been set up throughout the republic.

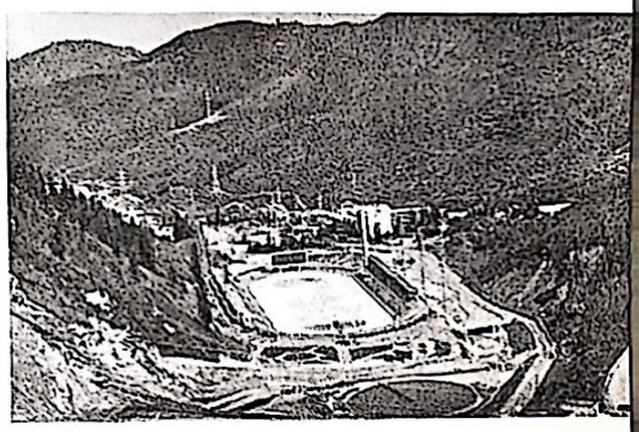
The Kazakhs, once a nomadic people, have preserved many of their ancient customs. On holidays the men take part in horse-racing competitions often lasting for several days, with winners ranging from the age of 13 to 72. Highly popular are the competitions of *akyns*—singers-improvisators, who vie with one another in wit and resourcefulness.

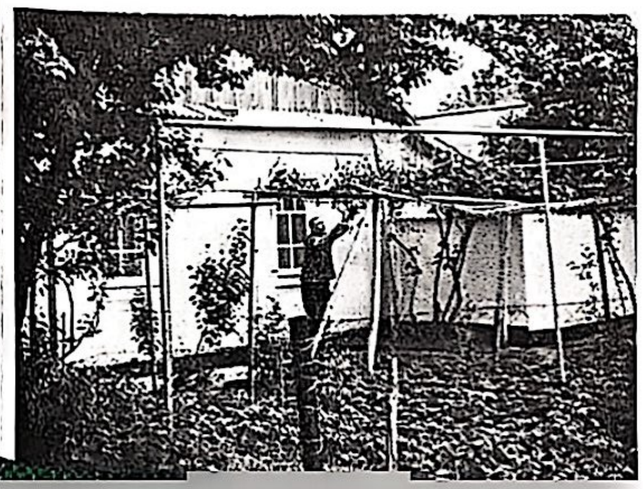
In summer when the snow thaws in the mountains the valleys are threatened with landslides. Mud and rock avalanches often crash down the slopes at lightning speed destroying everything in their way. Such avalanches were a constant threat to Alma-Ata and had often taken it by surprise. The biggest of all took place in 1973. But the devastating onrush with a force of 120 million hp was halted by a special dam which had been built shortly before and incorporated over 6 million tons of rocky earth. Since then the dam was raised from a height of 100 to 145 metres—just in case.



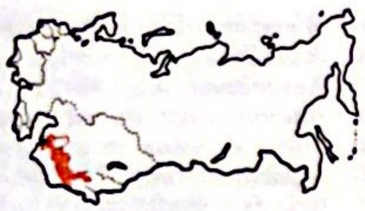
Watering place in the desert. Metallurgical works in Karaganda. Oil worker. A stadium high in the mountains. A house in a factory residential zone. "Catch the girl" is a traditional national sport.







UZBEK SOVIET SOCIALIST REPUBLIC



Area—447,400 sq. km
Population—15,400,000
Capital—Tashkent
(population 1,800,000)

Uzbekistan is a land of green valleys, blue mountains and flowering oases amidst sandy deserts. It is known for its glossy karakul skins, fragrant melons, high-grade rice, brightly-coloured silks and beautiful rugs. It has over 100 industries. But its main product is cotton.

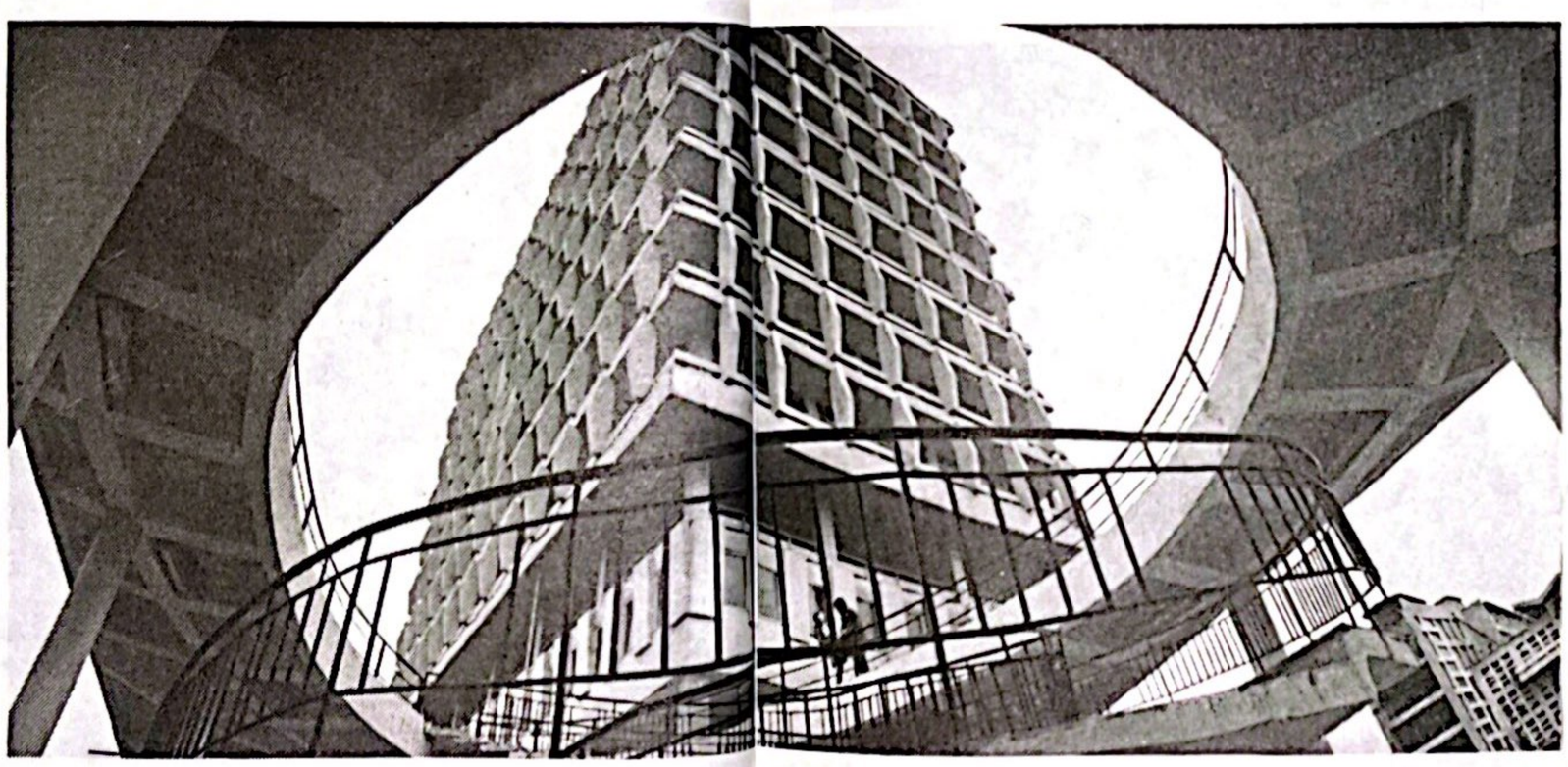
Uzbek cotton plantations are the northernmost in the world. They are constantly threatened by torrential rain and hailstorms. Aircraft is now used to disperse menacing clouds by means of chemicals. But the fight is still on against moving sands, excessive heat under a scorching sun, saline underground waters and pests.

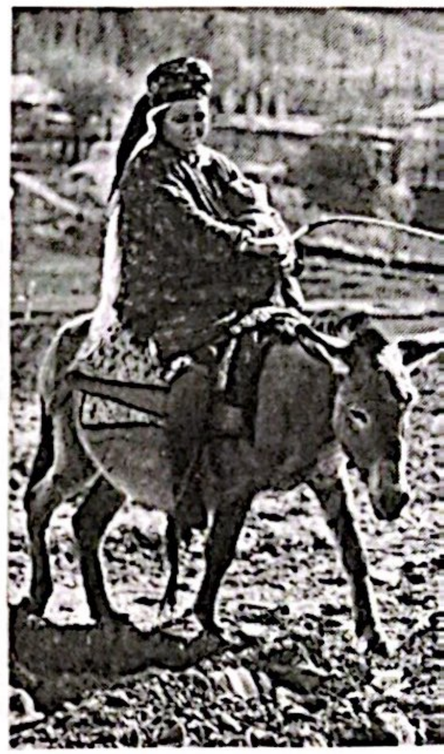
To take in a five-million-ton cotton crop by hand would require at least three million pickers. The problem is solved by mechanisation of cotton growing. Every fifth farmer in Uzbekistan is a machine operator. A total of 30,000 cotton-harvesters are employed in the fields.

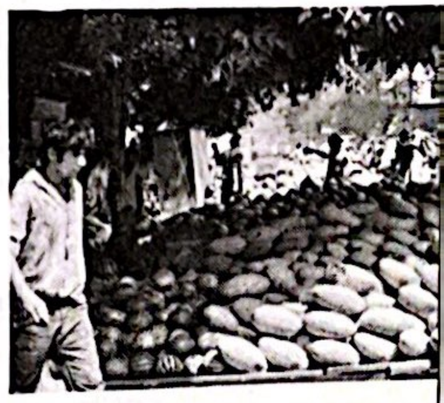
Uzbekistan produces coal and gas, non-ferrous metals and precious metals including pure gold. It makes aircraft, excavators, textile machines, electronic equipment, cotton-harvesters and other machines for cotton-growing.

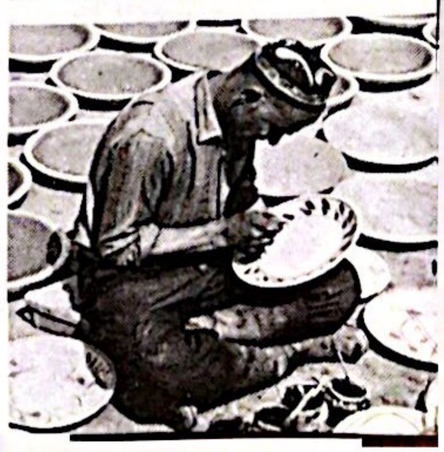
Uzbeks are masters of ceramics and wood carving. Traditional ornamental patterns, among them the "camel's eye" or "snake's trail", are executed on plates, quaintly shaped vessels and toy statuettes. Wood-carvers prefer two styles of ornamentation: an intricate pattern of geometrical figures and interlacing lines with leaves and flowers.

Sports, particularly wrestling, basketball and fencing, are popular in the republic. In keeping with national traditions these sports are also practised on horseback and the competitions are always a gala event. The women's field hockey team from Andijan won the USSR 1979 championship.









Tashkent University. Donkeys are basic transport high in the mountains. A traditional hairdo. Family group. Bazaar. A new cotton crop. Painting ceramics.

Area—198,500 sq. km
Population—3,500,000
Capital—Frunze
(population 533,000)

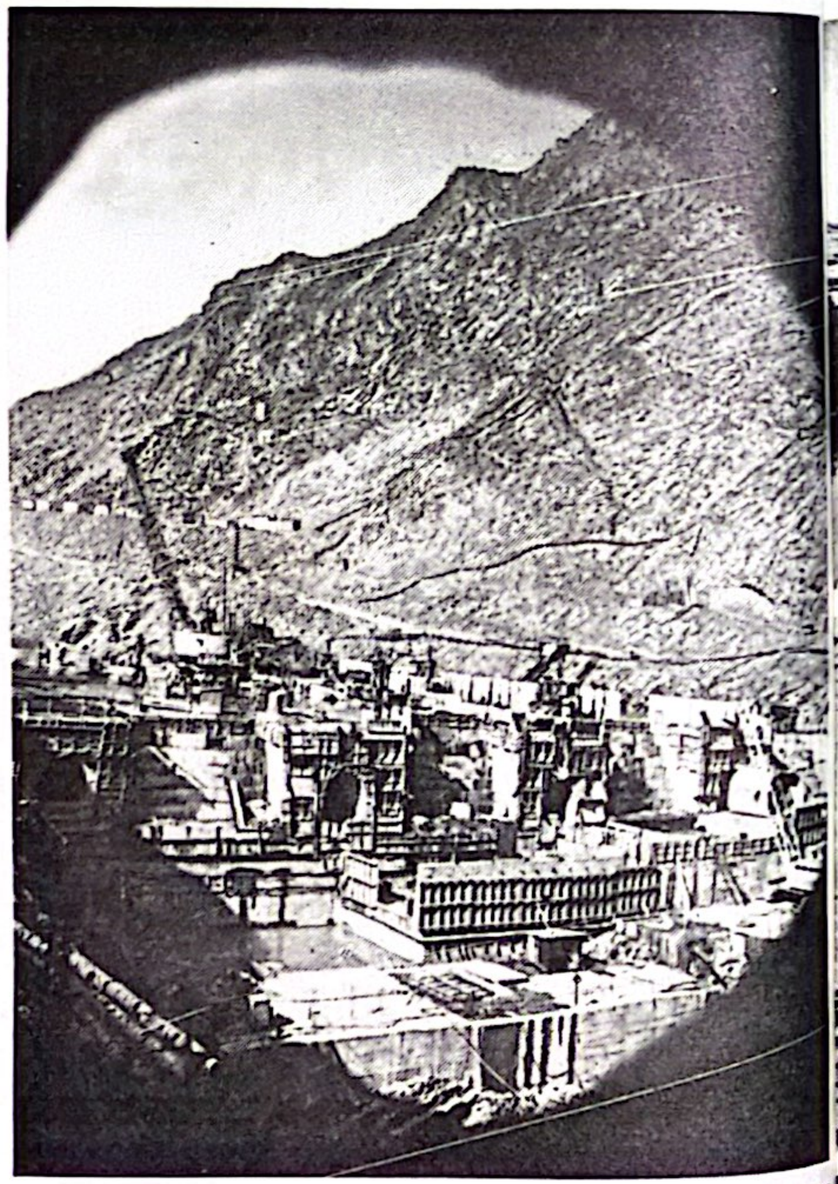
Kirghizia's landscape is dominated by the Tien Shan and Pamir mountain ranges which cover two-thirds of the republic's territory. Unfortunately they are in the process of orogeny. Hence the frequent earthquakes which sometimes occur 5 to 6 times a year with one or two reaching a force of 10 or 11 on the Richter scale.

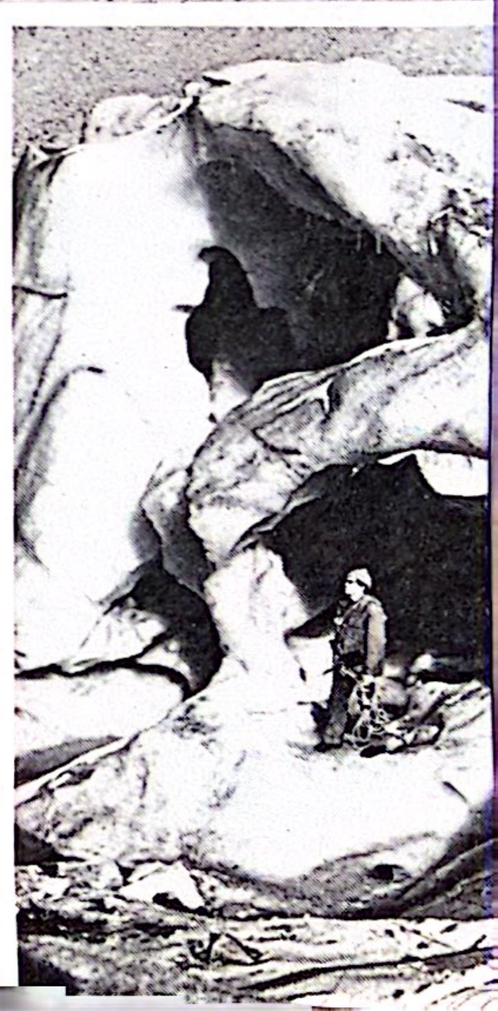
The mountainous landforms have made the Kirghiz value even the tiniest bit of fertile land. The main farming zone is the Chu valley, whose irrigation system incorporates 14,000 automatic hydro-engineering units. The entire hydro-engineering complex is run with the help of electronic computers.

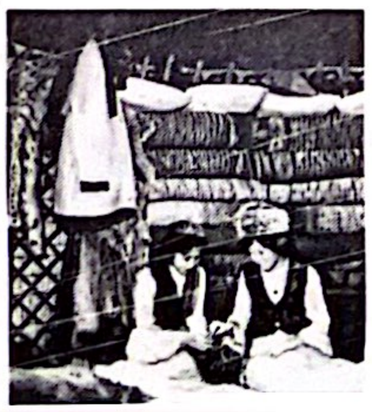
Nearly three-fourths of Kirghizia's farmlands are irrigated. The republic grows wheat, cotton, tobacco, kenaf, essential oil crops, grapes and fruit. Animal husbandry—the breeding of fine-fleece sheep and pedigree horses—remains, however, the main branch of agriculture. Ten million sheep graze in the valleys and the Alpine pastures of the Tien Shan.

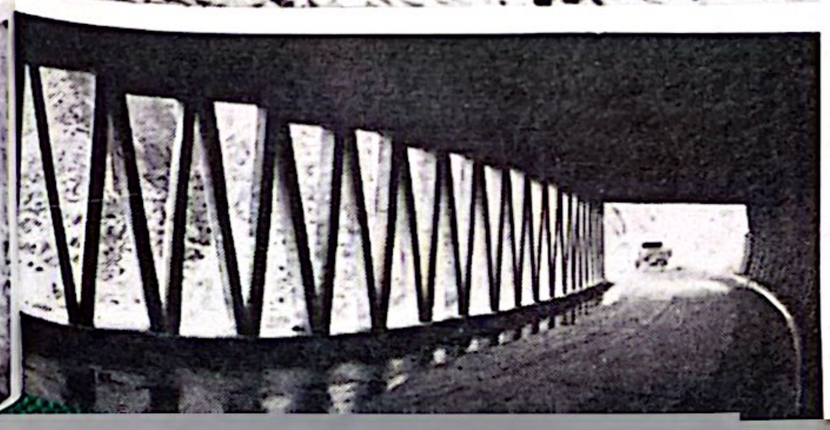
The mountains of Kirghizia are rich in minerals which include mercury, antimony, coal, tin, zinc, molybdenum and tungsten. Big enterprises of non-ferrous metallurgical, engineering and instrument-making industries have been built. The mountains are covered with nut-trees, but the most famous tree of these parts is the juniper, some specimens of which are a thousand years old.

In summer boys play the ancient popular game *ordo* in the shady lanes of Frunze's parks and public gardens. A bat is used to knock out an assortment of bone-carved figures placed in a special order. It is a game that is enjoyed by old men as well. But the equestrian sport is the most popular. Not a single folk holiday passes without the various Kirghiz horse-racing events. One of these is the "Kyzkuunai" where the prize goes to the rider who is able to overtake a horsewoman and kiss her as the horses charge ahead. If he fails, he gets a lash of her horsewhip. And one has to be unusually agile to pick up a coin while galloping at full speed.









Another hydropower station is going up. In the centre of Frunze. Flock in the mountains. Glacier. Inside a yurt. Making cakes is a man's job. Mountain tunnel.

Area—143,100 sq. km
Population—3,800,000
Capital—Dushanbe
(population 493,000)

Tajikistan is a mountain country, with 93 per cent of its territory being covered with mountain ranges. In the western Pamir, known as the "roof of the world", is found one of the world's few remaining forests of walnut trees. Many of the trees in the 40,000-hectare preserve are 300 years old.

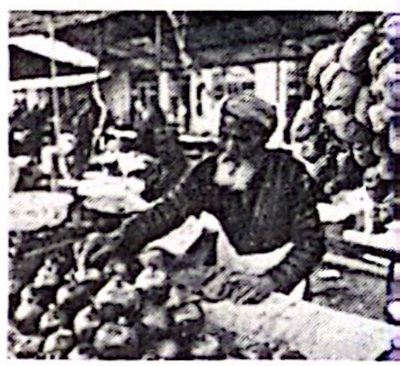
The republic's chief wealth consists of the swift Vakhsh and Pyandzh rivers which converge to form Central Asia's biggest water artery—the Amu Darya. A hydropower project has been constructed on the Vakhsh river. The Nurek power station (2.7 million kw) with its 300-metre high dam began operating in 1979. Now under construction on the same river is the Rogun hydropower station and the Baipazin power station.

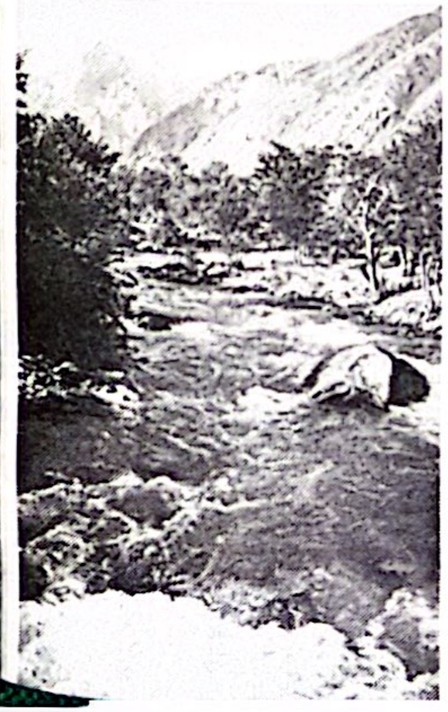
The abundance of energy resources, raw materials, as well as considerable manpower resources have promoted the development of the republic's chemical industry, nonferrous metallurgy and engineering industries.

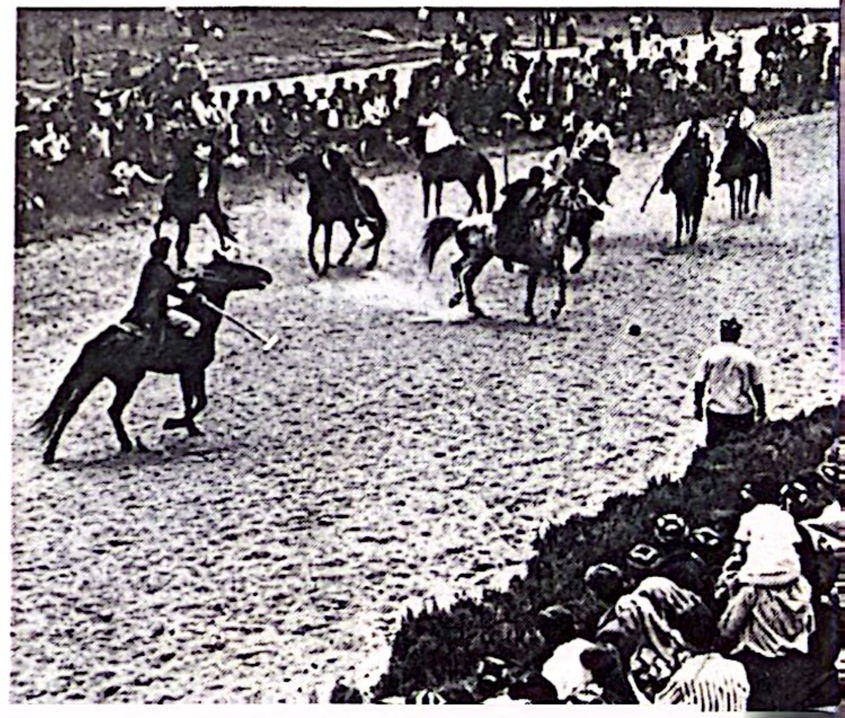
The Dangara valley is ideal for sheep breeding. Nearly a thousand shepherds work here, and though their native villages are hundreds of kilometres away they live here in well-appointed houses with gas and electricity.

High up on a rocky plateau in the Pamir is the Pamir Biological Institute. Most of the plants cultivated in its botanical gardens and subjected to powerful solar radiation have shown an unusual capacity for growth. Here potato tubers grow into four-kilogram giants and a single tomato plant yields up to 10 kilograms of fruit.

Tajik women, unlike women in other parts of Central Asia, have never covered their faces with the parandja and have always enjoyed the respect of their men. To celebrate the birthday of the first-born child the mother invites her girl-friends to a festive dinner while her husband as the head of all the male members of the family prepares the meal and drinks and serves the guests. Women standing in queues are always allowed to be first and even if there are many of them the men always wait gallantly until the women are attended to.







Having lots of fun. Students. Fresh pomegranates. Archer. My daddy made this dish. Yaks. In the Pamir foothills. A game of polo.

TURKMEN SOVIET SOCIALIST REPUBLIC

Area—488,100 sq. km
Population—2,800,000
Capital—Ashkhabad
(population 312,000)

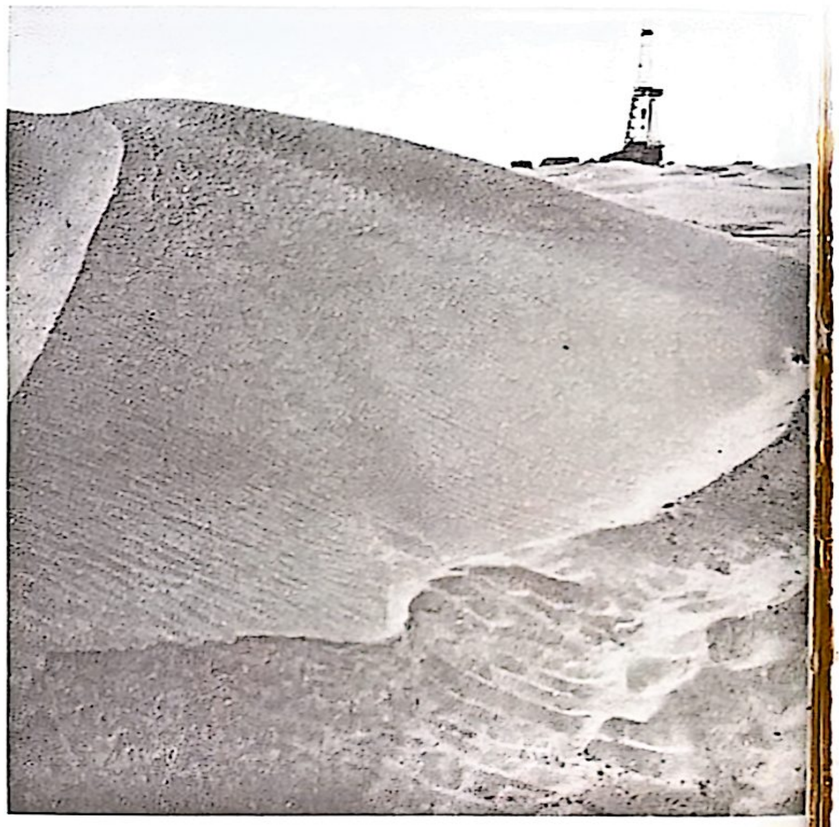
Yellow is the predominant colour on the physical map of Turkmenia, for more than four-fifths of its territory is taken up by the Kara Kum desert. It is covered with wrinkled clay soil areas, sand hills, which can reach as high as a five-storey house, and solonetz areas. The desert is full of secrets and ancient mysteries. Archaeologists have found here the ruins of Nisa, the ancestral home of the Parthian kings, and the remains of the medieval town of Misrian—all that is left of the once powerful Dakhistan state.

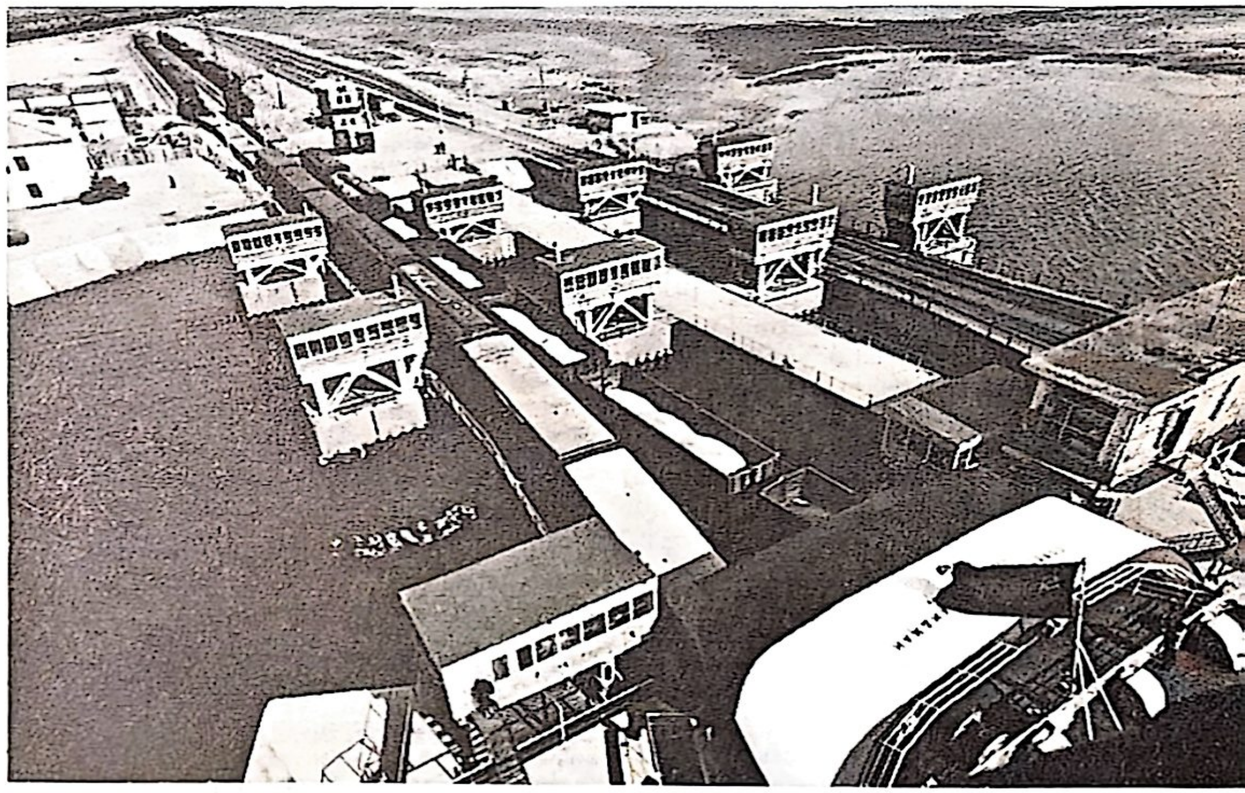
Archaeological excavations have not only added to our knowledge of the history of Central Asia. They have also proved useful in the laying of the 1,000-kilometre-long Kara Kum canal following the traces of ancient oases. The new waterway begins from the Amu Darya and runs across the entire republic to the Caspian. The man-made tributary branches off into numerous canals and water reservoirs which bring water to former desert lands turning them into fields planted with fine-fibre cotton. The Kara Kum canal is navigable and abounds in fish. Ichthyologists are at work here alongside sailors and fishermen. It is a strange sight to see sea gulls hovering over the desert stretches. Ducks and snipes nest on the shores of the man-made lake Chalysh. Water mains have been installed in towns situated in the heart of the desert.

By bringing water to pasturelands and "fastening down" the sand hills, cattle breeders increase the population of karakul sheep and of Akhal-Teke horses which are known far and wide for their beauty, speed and stamina.

Geologists have developed copper, mercury and sulphur deposits, gypsum quarries, and other mineral resources which have led to the appearance of oil-refining, gas, chemical and other industries in the republic.

The Institute of Desert Studies of the Turkmenian Academy of Sciences has completed an experiment called "Desert". The obtained data helped scientists study the influence of the desert on weather and climatic conditions of Central Asia and surrounding territories.





Sand dunes. Ferry across the Caspian. An archeological find. Camels grazing. Family reunion. Scientists study the movement of sand. A big catch in the desert. Getting the orchard ready for summer.

Public Health

Any person can receive whatever medical aid he needs—from a visit to a doctor to the most complicated operation—free of charge, at any place and any time. This free and readily available medical assistance, plus rising living standards and the expanding state-run system of social security, have substantially reduced the mortality rate in the USSR and raised the average life expectancy to 70 years.

The new generation of doctors know about most dangerous diseases only from textbooks. The incidence of such infectious diseases as measles, which was once widespread, has dropped. Diphtheria, malaria and trachoma have been virtually eliminated, while poliomyelitis strikes no more than one child in two million. Over 80 per cent of those who have suffered from myocardial infarction, until quite recently a lethal affliction, now live a full life and are able to work. In recent years there has been no rise in the death rate from cancer.

Cardio-Vascular Diseases

Some fifteen years ago a well-known American surgeon said it would be as hard to create *an artificial heart* as to land a man on the Moon. Five years later an American, Neil Armstrong, stepped onto the Moon, but medical science is just as far away from an artificial heart as fifteen years ago.

Transplant surgery is no solution to the problem. The fact is that every year thousands of people need to have their hearts replaced. But where can all these human hearts be obtained? Only one per cent of people who die in accidents can be regarded as potential donors. That is why the Soviet-American Agreement on Cooperation in Artificial Heart Research and Development was signed in Moscow in 1974, giving a fresh impetus to a series of joint experiments in cardiology. Specialists from both countries implanted experimental models in animals which survived for several days with a device replacing the heart. The two sides informed each other of experiments which had the most promising results.

Today the development of an artificial heart, like space research, has become a measure of a nation's progress. Only a country with a sufficient scientific and technological potential can undertake such costly and complex research. The Soviet Union has been working on the problem for more than seven years and has made and tested over 20 different models of artificial heart, but none of them have proved good enough.

The purely surgical problem has long been solved and, given a reliable artificial heart, surgeons could now fit it just as easily as they fit artificial valves or blood vessels. The problems that remain to be solved are technical. The first is that of materials. The material of which the artificial heart may be made must be exceptionally tough yet chemically inert so as not to react with the blood and discharge harmful substances into it.

Doctors (in thousands)	1940	1960	1970	1975	1978	1979	1980
	155	432	668	834	929	958	993

Surgeon Valeri Shumakov at work

Very many variants have been tested, from titanium alloys to the latest polymers. A suitable material has at last been found in Leningrad. A metal valve was coated with a very fine layer of graphite on which scientists managed to grow protein. It was a case of organic matter uniting with non-organic matter, and success came after the 44th operation on a dog. This heart valve operated for seven years and one month in laboratory tests, while the required working life is 25 years.

American scientists in turn have developed biological plastics for lining the inside of artificial heart.

One of today's pressing tasks is to develop a system of automatic control for the artificial heart. Here Soviet specialists have been successful. As a result of the combined efforts of medical, biological, cybernetic, mathematical, engineering and other experts a mechanical heart has been designed which reacts to all changes in the organism as sensitively as a living heart.

A system dispatched to the United States in 1979 can gear the work of an artificial heart to the body's physical requirements.

But still, when will we have an artificial heart that can safely be implanted in the body?

Prof. Valeri Shumakov, Director of the Institute of Artificial Organs and Tissue Transplantation: "Not before the beginning of the next century, I think. It will most probably be powered by nuclear energy. We have already built two such models of a heart."

Cancer

Scientists now know a great deal about factors which stimulate the development of malignant tumours and can artificially induce in animals cancer of the skin and liver, various tumours in the gastrointestinal tract and sarcoma of the bone. This is done by using various cancerogenic agents and viruses. But it has not been proved that the same factors cause cancer in man. If it were so, we would already have found the key to the problem and would have learned how to use it. One reason why this is so is that these experiments, naturally, are not conducted on people.

Specialists believe malignant tumours appear when several factors coincide—genetic, external and factors of the inner medium.

"It is a deleterious combination of chemical substances, physical and biological phenomena and hereditary predisposition that create conditions for the rise of a malignant tumour," says Boris Peterson, deputy chairman of the USSR Cancer Society.

Thirty years ago Soviet Academician Lev Zilber formulated a virus-genetic theory of the origin of cancer which has been fully confirmed. Research has shown that malignant tumours develop as a result of certain genetic and immunological deviations.

Leading Soviet cancer specialists are unanimous in their optimistic forecast: the great discovery of a cancer remedy can be made within the next ten years. Their optimism is based, among other things, on the vast scale of research being conducted in the USSR into ways of combatting malignant tumours.

The USSR Academy of Medical

"Rokus" gamma-ray installation at the Moscow Cancer Institute

Sciences has approved a nationwide oncological programme for the period up to 1990, pooling and coordinating the efforts of researchers and practising doctors. Its headquarters is the new cancer centre in Moscow, whose six-thousand-strong staff form only a part of the vast nationwide cancer service. Most medical colleges have cancer departments and courses. Cancer treatment at 300 specialised clinics equipped with the latest techniques is proving quite effective.

What is called *the proton scalpel* is now widely used in clinical practice. Unlike gamma radiation, which has long been in use, a beam of protons is concentrated within the strictly limited area of the cancer target. When protons are fired into the tumour, which often lurks in nooks and crannies of the body, they do no harm to healthy tissues.

The building of costly proton accelerators and of complex electronic systems to handle them, as well as all cancer research involving the natural and technical sciences, is a too big problem for any one country to work on. In 1973 the Soviet Union joined with seven member-countries of the Council for Mutual Economic Assistance in mounting an offensive against cancer. They divided among themselves the nine basic problems covering all aspects of oncology. Diagnosis of tumours is being researched by the German Democratic Republic, chemotherapy by Hungary, radiotherapy by Poland, the virus aspects by Bulgaria, and the scientific principles of the organisation of anticancer work by the Soviet Union. Altogether more than 90 institutes and other establishments are involved in the programme.

Someone who has had malaria may also have been cured of his cancer. Doctors have long known that malaria fever can inhibit the development of malignant tumours, but infecting cancer patients with virulent fevers is a very dangerous undertaking.

Then came the triumph of radiotherapy. Chemotherapy was also making headway, developing increasingly effective antitumoral preparations. But neither ray, drug nor scalpel could solve the whole problem, so cancer researchers again turned to *hyperthermia*, or artificial overheating.

It was found that tumoral cells feed mainly on glucose and have a ferocious appetite, eating their ration 16 times faster than normal cells. Finishing its own ration a tumour steals glucose from healthy neighbouring cells, thus destroying them. A dead zone spreads round the tumour which is literally bursting with glucose.

This discovery suggested a line of attack and the insatiable cells were overfed. Their sensitivity to high temperature was also taken advantage of. These cells die at a temperature of 42 degrees Centigrade (remember malaria?) while normal cells easily survive this temperature for many hours.

The practical results were encouraging. The new method was applied more vigorously on a broader scale. Hot-and-cold showers were used, with hot jets to the body and cold jets to the neck and head.

But hyperthermia is only a first approach. The second is based on the tumoral cells' chronic need of glucose. The tumour is given four times its normal supply of glucose. It then forms and accumulates lactic acid with resulting overoxidation. Healthy cells are not affected by a surfeit of glucose, because they will not absorb more than they need.

Overoxidation and overheating are supplemented by chemo- and radiotherapy. But the dosage is several times less because the cancer cell has been weakened.

Experience shows that substantial changes occur in the tumour on the 3rd-10th day. As a rule it decreases in size (and is sometimes fully resolved) to such a degree that it can be operated on. Analysis of dissected tissue shows that mass necrosis (mortification) develops in the tumour and cellular structure is disturbed. No such changes are to be observed in normal tissues. The researchers' efforts have yielded good results in the treatment of *melanomas, chondrosarcomas, synoviomas and cancer of the mammary gland.*

Marked progress has been made in the treatment of chorionepithelioma of the uterus, a malignant tumour which usually afflicts young women. The patients are not only cured but also remain able to bear children. Their babies are strong and healthy although not so long ago their mothers' life was in jeopardy.

Thanks to early diagnosis nobody now dies of cancer of the skin or lower lip.

Despite all this the incidence of cancer has not yet been substantially reduced. Cancer specialists explain the paradox in this way:

"The population as a whole is growing older and malignant tumours mostly affect older people. In the past, when life expectancy was much shorter, many people simply did not live long enough to develop cancer."

Out of every 100 cancer patients in the USSR 85 are men, mostly smokers. But the heaviest toll is taken not by lung cancer but by cancer of the stomach.

The mass preventive check-ups conducted throughout the USSR help to detect cancer at an early stage and improved methods of treatment help to save patients' lives. Despite the growing number of cancer patients, the death rate from cancer among men has been stabilised in the last 15 years, while there is a definite decrease in the incidence of cancer among women. Of the two million people who have been cured of cancer and are under observation at specialised oncological centres, 1,500,000 are virtually fit and over 500,000 of them were cured ten or more years ago.

Traumatology

A girl of about twenty stood with crutches facing doctor Gavriil Ilizarov. On her right leg was an apparatus he had designed.

"It's time to remove the apparatus," the doctor said.

"Oh no, it's too early," she objected, "my right ankle is still thinner than the left one. It doesn't look nice..."

"It doesn't look nice!" she said. Only a short while ago the patient couldn't even think of such a thing—in fact no one anywhere in the world could have helped her to walk norm-

ally. And now she didn't like the shape of her ankle!

Gavriil Ilizarov proposed the first version of his apparatus in 1951. It consisted of two rings crossed with two spokes with which he pierced the bone above and below the fracture and three or four rods which he put on the bone, fastening them to the rings with nuts. By bringing the rings closer together with the help of the rods it was possible to press the fragments firmly together.

For the first time in the history of traumatology a surgeon was knitting bones without the traditional plaster-of-Paris bandage.

Gavriil Ilizarov once operated on a patient whose leg was shortened and distorted. The surgeon wanted to straighten the leg, so he put his apparatus on it and started to return the bone gradually to its natural position. It was then that he noticed that young bone seemed to grow on the surfaces that had been pressed together and fixed. The rate of growth was not more than one millimetre a day. But if bone could grow when influenced in a certain way, it meant that its growth could be controlled! It meant that a bone's shape could be changed in a bloodless way, correcting extensive defects without operations and the transplanting of tissue.

Today Ilizarov's apparatus consists of a multi-purpose set of several basic parts—spokes, rings, rods and nuts—and equally simple extras—half rings, arcs, hinges and pulleys. By combining them one can assemble apparatus of virtually unlimited variety to suit the specific requirements of any injury or ailment. The combination of units enables the surgeon to tackle simultaneously several problems which used to be sometimes mutually exclusive—to knit bones in one place, draw them apart in another, stretch a bone here, and so on.

Gavriil Ilizarov now heads a big institute. The village doctor who first tested his invention on a spade handle and then sought the help of fitters from a neighbouring factory, now has a vast experimental factory at his disposal in addition to the institute.

Gavriil Ilizarov

Allergy

The human body gets used to the tempo of urbanisation, but this adaptation is gradual, while the urban environment changes very rapidly. Conflict situations arise between man and the fruits of his activities. Allergy is one of them, a condition which is often very hard to cure.

But in most cases allergy is forced to retreat at the allergy centre in Kislovodsk where 95 per cent of the patients are either completely cured or begin to feel much better. Many asthma patients improve their condition even without special medical assistance, with the help of natural factors. Allergologists prescribe

Allergological centre in Kislovodsk

carbon dioxide baths, long spells in the open air, muds, inhalation and exercise therapy.

The procedure in most cases is to establish the allergen or a group of them which causes the condition, then give the patient microdoses of the allergen to let the body get used to it and develop immunity.

Vascular Surgery

Surgical operation offered the only chance of saving his leg. The 39-year-old patient, a pilot, had been discharged on medical grounds and classed as an invalid, and the ominous word "amputation" was often heard at surgeons' consultations because necrosis, or gangrene, had already begun in his fingers.

Now a team of surgeons was busy behind a sterile sheet in the operating room. The leading surgeon wearing binocular glasses was examining the diseased blood vessel. Just where the aorta bifurcates he saw it was all overgrown with scar tissue—grave endarteritis, where ultrasound is of no use.

"Scalpel!"

The scar tissue was removed from the aorta and the vascular canal opened.

The sister handed the surgeon waveguides. The generator was turned on and the guide stem gently inserted deeper. It may be rather a crude comparison but it was like driving a difficult drift in a mine. At last the thrombus, or blood clot, was extracted.

Inflammatory processes in arteries lead to the appearance of thrombuses or cause the connective tissues to grow. As a result the vessel is blocked. Both ailments—*atherosclerosis* and *endarteritis*—often strike quite young people and therapeutic and even surgical treatment is not always effective.

Until recently necrotic portions of a vessel affected with atherosclerosis were removed and replaced with an artificial tube. Today surgeons employ ultrasound to separate soft tissues of different density, removing the diseased layer together with the thrombus. After the operation the inner lining of the vessel is restored and the vessel revives.

Whereas formerly surgeons were mostly engaged in cutting and removing, now they more often stitch in and construct. They have succeeded in treating conditions which only recently were thought inoperable.

Vascular operations make it possible to cure *hypertension* in patients with malfunctioning kidneys or with a narrowing of the aorta and to halt incipient *gangrene*. Prof. Anatoli Pokrovsky was the first to perform such operations on the liver, stomach and other abdominal organs. Vascular restorative surgery is now helping to save many more lives.

Blood bank at the Blood Transfusion Institute

Microsurgery

The only noise in the operating room is a tiny sound like the buzzing of a bee. The surgeon is holding a flexible metal cord with an almost invisible needle at the end. The needle touches the patient's temporal bone which is lit with a narrow beam.

It takes the surgeon an hour to bore through three centimetres of bone. Behind the bone shield, in the occipital region, almost next to the brain, is a tiny pit, or fossa, which can be only seen in an electron microscope. It contains a little sac where surplus drops of liquid appear as soon as the patient's blood pressure rises. Very few—one, two or maybe three—yet they cause violent giddiness and deafness and may make a person an invalid. The condition, known as *Ménière's disease,* is caused by excessive noise, stress and too fast a pace of living.

Vladimir Palchun was the first Soviet surgeon to cure Ménière's disease by operation in 1979. He makes a puncture in the little sac and sets up a drain. When blood pressure rises, the surplus drops of liquid find their way out through the drain.

Ophthalmology

The children were playing hide-and-seek. One of them, a very short-sighted boy, tripped and fell, smashing his glasses. A piece of glass stuck in his eyeball. He was taken by ambulance to a Moscow clinic. The pain ceased on the third day, the bandage was removed and it was found that the boy's short-sightedness had also completely disappeared.

That was how ophthalmologists learned to correct the shape of the cornea, cutting it slightly until the patient was able to read the tenth and last line of the eye-chart. Together with *short-sightedness* they have also begun to rectify *astigmatism.*

Even a 54-year-old patient who has worn minus 8 diopter glasses for 40 years has recovered 100 per cent vision. Only pathologically extreme short-sightedness or long-sightedness still defy surgical treatment.

Psychiatry

For generations psychiatrists have sought a connection between mental diseases and changes in the body's biochemical regime. For a long time they could find none, so some schools of psychiatry denied the material, biological nature of mental disturbances. The lack of unanimity of views gave rise to notions of psychiatry as a branch of medicine lacking objective diagnostic criteria. This widespread notion encouraged those who sought to start campaigns against psychiatrists, to discredit them and accuse them of incarcerating healthy people in their psychiatric hospitals.

The reports read at the 1979 International Symposium on Psychiatry in Moscow point to the clear conclusion that mental derangements are a consequence of bodily diseases, of disturbances in the chemical balance which can be measured. Soviet scientists reported, in particular, that they had been able to detect definite metabolic changes in *schizophrenia* patients. The discovery of a relationship between the particular condition of a patient, the form of his affliction and the composition of specific chemical compounds opens up new ways to solving the riddle of how mental conditions arise, to seeking effective methods of treatment and to synthesising drugs for that purpose.

Hematology

Forecasts of future developments in science and engineering, based on specialists' opinions, are often reported in the press. They tell us in what

Apparatus for post-operative control

year the first thermonuclear power station will be launched, a man land on Mars, and so on. Several years ago a science and technology agency in Japan predicted that in 1989 *artificial blood* would be produced able to carry oxygen to all parts of the human body. At that time no liquid solution used in medical practice could perform one of blood's most important functions, that of transmitting oxygen.

In human blood the oxygen is carried by erythrocytes each of which contains several thousand million molecules of the protein pigment hemoglobin. Each molecule has four atoms of iron. When atoms of oxygen join them, an unstable chemical complex is formed whose oxygen is easily transmitted by the blood to the tissues. The scientists' task was to build a model that in its functions would resemble erythrocytes as closely as possible.

At the 12th International Congress on Blood Transfusion Soviet scientists reported that the model of an artificial oxygen carrier had been built, based on chemically modified hemoglobin.

The idea underlying research strategy here was to increase the size of the hemoglobin molecule. In nature the molecule is large enough not to escape through the erythrocyte's numerous pores which let through the atoms of oxygen. Outside an erythrocyte it quickly leaves the body through the kidneys.

Some models were created by sewing several hemoglobin molecules to each other or to other substances, such as the protein albumin.

"Now that we have models of artificial blood," says Prof. G. Rozenberg, "we can talk of developing a blood substitute that is sufficiently complex in composition and multifunctional in operation to be truly called artificial blood."

Medical Technology

The Institute of Clinical and Experimental Surgery has developed electroroentgenography—a new, universal, quick as well as the cheapest way to obtain X-ray pictures on ordinary writing paper. Soviet *roentgenographers* are in demand on the foreign market.

* * *

Nowadays a heart operation is necessarily a team effort. Besides the leading surgeon—the conductor, you might say—there is a whole "orchestra" each member of which has his own part to play. So it was no accident that the new electronic complex,which watches the patient's condition and checks the entire performance of the team of surgeons and anaesthetists, has been called *Symphony*. It tells the doctors all that is happening in the patient's body, especially his circulatory system, and instantly and precisely analyses these data, which are constantly changing in the course of the operation.

Symphony keeps the patient under observation not only on the operating table but also in the intensive care ward. It can observe 16 patients simultaneously. Specialists from the cardiological centre in Birmingham, USA, and scientists from other countries have come to the

clinic of the Institute of Experimental and Clinical Surgery to familiarise themselves with the new computer system.

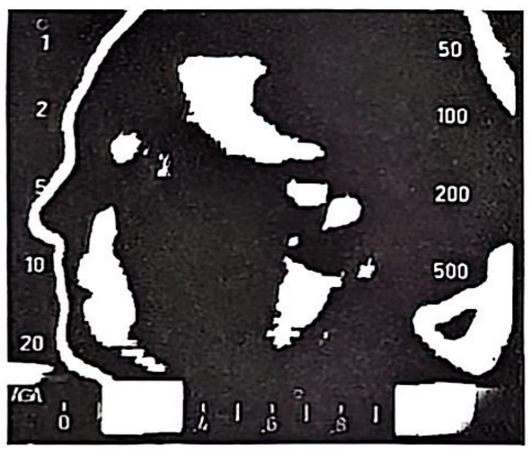
* * *

The Institute of Optical and Physical Measurements has designed a *diagnostic complex* dubbed the "black box". Its instruments record various data about a patient's condition in a matter of minutes and instantly show in figures all deviations from the norm. Diagnosis is based only on the optical and physical properties of the skin.

Luminiscence of the skin in darkness is caused by the chemical and biological reactions in it as a result of metabolism and is usually accompanied by the emission of heat. The intensity of this luminiscence helps identify poisoning, vitamin deficiency, atherosclerosis, nervous stresses and the early stages of cholecystitis, glaucoma, diabetes and cancer.

The places where luminiscence is most intense coincide, as a rule, with the biologically active points which are used in acupuncture. In order to locate these points the institute has built a set of devices called "Rhythm". These can take measurements at several points simultaneously and instantly apply heat to them, that is to say, to employ the principle of needle therapy. An improved version of the apparatus incorporates a laser beam which combines the principles of acupuncture and cauterisation. It can help stimulate the peristalsis of atonic intestines or cure chronic lumbago. The new version of "Rhythm" is also being tested in maternity clinics.

The "Black Box"



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The factories of the Ministry of Medical Industry have started producing *apparatus for the artificial ventilation of lungs* and systems for the extraction and transfusion of blood and infusion solutions. Other novelties in medical technology include *sets of instruments for microsurgery of the eye.*

Organisation of Public Health

Disease prevention is a fundamental principle of the Soviet public health service. Specialised centres have been set up to control TB, cancer, psychoneurotic, skin and venereal diseases, as well as maternity centres, including mobile advisory teams, consultation clinics and other medical establishments which every year examine up to 160 million virtually healthy people. This helps to detect diseases at an early stage and greatly to increase the effectiveness of treatment, as well as to diagnose what Soviet doctors call preillness, that is to say, to protect the health of healthy people. For purposes of disease prevention members of the medical profession take an active part in improving environmental protection and working conditions at factories and offices.

Polyclinics. Everyone can get the medical treatment he needs at his or her local polyclinic. These have specialist departments as well as sections and laboratories for diagnosis and treatment.

Each polyclinic serves the population of a particular residential area,

The radon hospital in Pyatigorsk

which is divided into smaller areas served by physicians or pediatricians who not only see their patients at the polyclinic but also pay home visits.

Hospitals. In recent years most of the new hospitals have been big specialised ones with 1,000 or more beds in towns and up to 400 beds in the countryside. More and more cardiac, endocrinological and other specialised departments are being opened as well as centres for the treatment of vascular disorders and consultation and diagnostic centres.

Medical assistance at industrial enterprises. Plants and factories have medical departments or medical posts. Their medical staff keep a check on sanitary conditions at work, study the living and working conditions of the employees, especially women, give medical aid and treatment as required and find out who needs sanatorium treatment, a special diet or additional rest. In addition to the usual polyclinic and hospital, larger medical departments have *overnight sanatoria* where a worker may get the treatment he needs, a special diet and a good rest.

Health centres. The Soviet Union has a total of 14,000 regular and overnight sanatoria, holiday homes, tourist homes and camping sites—which altogether can accommodate two million people at a time. There are resort facilities for whole families and also for children, where they can not only rest and receive treatment but also keep up with their studies.

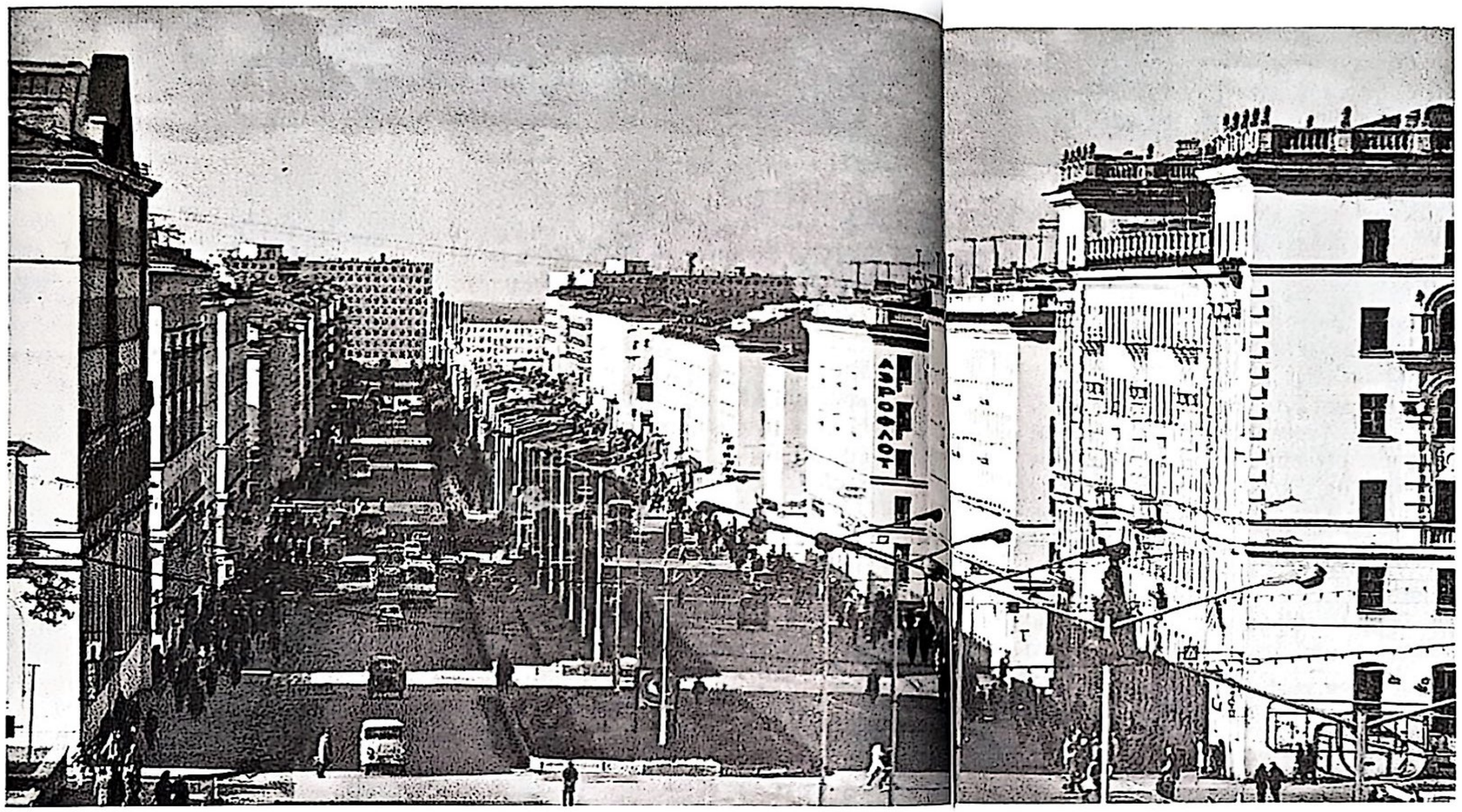
The **sanitary-epidemiological** service is a network of nearly 5,000 stations. Their staff see to it that the environment does not deteriorate, that a high standard of hygiene is maintained both at home and work and that preventive inoculations are made to give the population immunity against infectious diseases. They also concern themselves with noise pollution in towns and are responsible for fixing the permissible levels of the concentration of noxious substances in the environment and in foodstuffs. Significantly, only 150 of the 900 insecticides and pesticides used elsewhere in the world are passed for use in the Soviet Union and only two of the 15 dyes used throughout the world in the food industry are approved for use.

Drugs

The sale of drugs that are harmful or of poor quality is impossible in the Soviet Union. Every new medicine is thoroughly tried out on test animals—never on people, and only then is it examined by the Ministry of Health and the Pharmacology Committee. The inventors of new preparations must prove not only their effectiveness and harmlessness but also their advantages over existing drugs. The medicine is then studied at several clinics before being recommended for general use in medical practice. Drugs made abroad are subjected to the same test. The production of medicines in the Soviet Union is not a profit-making business, so there is no need to force the development of new drugs. Drug advertising is prohibited.

More than half of all medicines are provided free of charge. They are free to all hospital patients, to children under one year of age, to war invalids and to people suffering from tuberculosis, diabetes, cancer, rheumatism, blood disorders and certain other ailments.

CITY IN THE POLAR CIRCLE



In a children's cafe

Lenin Avenue

Norilsk is the world's northernmost town of miners, steelworkers and builders. It grew up around a large mining and metallurgical combine in the permafrost zone. Its birth offered the answer to an important question: "Should towns be built beyond the Polar Circle?" Its current development provides the answer to another question: "What should these towns be like?"

To live comfortably in the severe conditions of the Far North you need not only thick walls but also such things as winter gardens, greenhouses, roofed courtyards and indoor swimming-pools with controlled microclimates. Norilsk has all these, not to mention overnight sanatoria and preventive treatment centres where people go for medical treatment or a good night's rest straight from work.

The residents of Norilsk are provided with every kind of comfort, there is a well-organised system of public catering and public services which help to ward off what is called "Polar stress". The ionizers installed in houses and offices take care of the excessively dry air and geomagnetic fluctuations. During the long Polar night normal vision is maintained because the mercury-arc lamps or sodium lamps flood the streets with pale blue or yellow light.

But the town's biggest problem is linked with the physical disorders which people develop from lack of exercise: they have not much opportunity to walk because the schools, public service centres and shops are virtually next door to the residential buildings. Doctors prescribe skiing at tourist centres lying out of town where the ski routes are lit up throughout the dark polar night, swimming in the indoor pools at kindergartens, schools and factories, or going in for other indoor sports for which adequate facilities are provided at the town's gymnasiums and the "Arktika" Sports Palace.

Most of the population of Norilsk (over 200,000 today) are descendants of the first Polar explorers who came here three generations ago. They have done a great deal but they are going to do still more so that people will be able to enjoy everything the Far North can give them.

Housing Construction

Article 44 of the USSR Constitution guarantees the right to housing to all on an equal footing. Eighty-five per cent of housing is built by the state and is made available to the population free of charge for use in perpetuity. Prior to the adoption of the new Constitution it was a social service the state provided for the population. Now it has become a duty of the state. Over the past twenty years an average of two million flats a year have been built in the country, providing new housing for 240 million people.

At present the country's construction workers annually build enough apartment buildings to house a million people. Today the average housing space per urban resident is 12.3 sq.m.

Allocation of flats. Citizens in need of better housing register at the Soviets of People's Deputies at their place of residence or work. Enterprises and institutions build many houses for their employees at their own expense. The chief criterion in distributing flats is the urgency of the applicant's need for housing. War and labour invalids, newly-weds, families of servicemen killed in the war, those suffering from tuberculosis, families with more than two children or twins enjoy certain privileges. Additional space is allocated to those who need it for their work, such as scientists, writers and composers as well as families with members who are seriously ill.

Rent. Flats, together with all the equipment and installations in them, are allotted completely free of charge. Subsequent monthly payments (rents) are only for the living space, excluding the kitchen, corridor, toilet and bathroom.

Rent, which has remained unchanged for the last half century, plus utility charges, does not exceed, as a rule, 3-4 per cent of the family budget, or one per cent if charges for water, gas and electricity are not included in the rent. No one can be evicted for being in arrears or for any other consideration.

Upkeep of housing and the modernisation and rebuilding of flats that do not meet present-day requirements is financed by the state. Rent receipts cover only a third of the sums the state spends on the maintenance of housing. Annually a total of 10 million square metres of housing is demolished and the tenants are given flats in well-appointed dwellings.

Naturally, such policies make housing available to the whole population of the country.

Cooperative house-building. Despite the tremendous scale of state-financed housing construction, cooperatives of persons wishing to build flats with their own money are set up.

Each cooperative member makes an advance payment amounting to 40 per cent of the cost of his future flat. To cover the balance the state grants loans at 0.5-per-cent interest, repayable over ten to fifteen years.

Cooperatives account for seven out of every 100 flats built in the country.

New housing (in million square metres)	1946-1955	1956-1965	1966-1975	1976-1980	1981-1985 (target)
	441.4	964.7	1,063.3	530.0	530-540

At the fireside

Individual house-building. Every citizen can build a house of his own. Plots of land for such houses are allocated by the local Soviets for permanent use and free of charge.

Individual house-building is widespread in small towns and in the countryside. Individual builders are issued a state credit at an annual interest of not more than two per cent, repayable over twenty years, the credit covering 90 per cent of the cost of the housing. In the countryside half of the state's credit is repaid by collective and state farms.

Eight out of every 100 new housing units are built individually.

Housing construction in the countryside. The rural population has traditionally lived in small settlements. A natural trend today is the gradual amalgamation of small villages, their transformation into large settlements with modern amenities. When the inhabitants of hamlets and small villages move into larger settlements the state pays them the cost of their former homes and orchards. In the new settlements they are either provided with state or collective-farm housing or build houses of their own.

The houses in the new settlements are grouped round community centres with social, cultural and shopping facilities and are built with account taken of the national traditions and the local climate, and all the distinctive features and interests of the rural population.

Large-scale construction. The post-war housing shortage made it necessary to adopt an entirely new method, that of large-panel house-building. Housing construction became a mass production industry. Basic building components and whole rooms prefabricated at ferro-concrete unit plants and house-building complexes are assembled directly on the building sites. Similar building components are used to build houses of different height and design. There are about 100 standard designs which make it possible to build up to 2,000 different blocks of flats.

Large-scale housing construction is carried out in such a way as to form entire new residential districts and sub-districts, each with its own system of facilities and services, such as kindergartens, schools, shops and cultural and health facilities.

For urban architectural planning in difficult geographical conditions and a successful attempt to humanise urban space the International Union of Architects awarded the Gold Medal and Patrick Abercrombie Prize to the town of Shevchenko built on the arid Mangyshlak Peninsula.

A complete prefabricated room is brought to a construction site in Khabarovsk

BEACON IN THE DESERT

On the outskirts

From the plane flying over the Mangyshlak Peninsula one sees nothing but endless parched desert spotted with lifeless mud flats or buried under hot sands. It is barren and sun-scorched. It's an ocean of sun without a drop of water. But people are making their way into this wilderness, drawn by the famous oil of Mangyshlak. And not only the oil. Mangyshlak is virtually a treasure peninsula, concealing in its depths reserves of coal, copper, manganese, iron ore and many other minerals. This is where the town of Shevchenko has sprung up.

To the East its streets are hemmed in by sands and to the West it is washed by the Caspian Sea. There is not a single source of fresh water in sight. The few wells yielding a salty liquid and known mostly to shepherds and geologists cannot be seriously considered as a source of water supply for the town. Fresh water is provided by a powerful water-distillation plant using the heat generated by a fast-neutron reactor.

Residential blocks have three kinds of running water—drinking water, hot water and water for general use, and there are three sets of pipes in each flat. While saving as much water as they can, the people of Shevchenko do not grudge it when they need to water flowers, shrubs and trees.

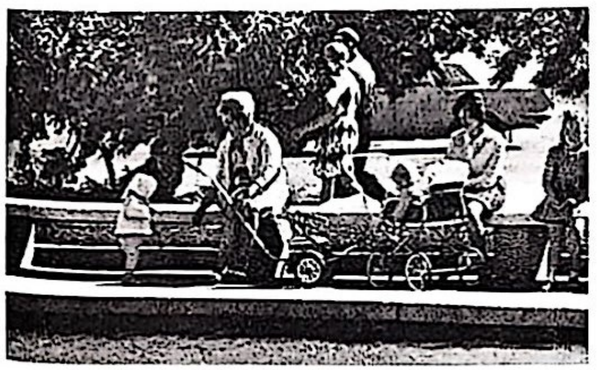
The centre of the town is much cooler than the outskirts—the hot bluish desert begins immediately beyond the last row of blocks of flats exposed to hot winds and dust storms. There, breaking against the light-coloured buildings and clusters of greenery, the waves of heat lose their force and do not reach the centre. But on the other side of the town the cool breeze from the Caspian blows freely among the blocks of flats perched on a hill sloping down to the beach.

The planting of trees and shrubs is directed by Alisa Pnyova, a forester who was appointed to the job in 1961 when Shevchenko was only emerging from the lifeless desert. She was given a free hand, since the town authorities had a very vague notion of what could be made to grow on hard and hot rock: on Mangyshlak there is no soil in the accepted meaning of the word. To plant a tree you have to make a hollow in the rock and fill it with soil shipped from elsewhere and then water it endlessly.

That's what people here have been doing. But they had to prepare the soil on the spot: so much was needed that it could not be brought from the opposite shore of the Caspian. They crushed shells, mixed them with solidified marine sediment and silt accumulating in the purifiers. The town now has 100,000 trees, 1,200 shrubs, more than 20 hectares of lawns and two hectares of flowerbeds.

There are already country houses on green plots near the town. This is incredible considering that water is supplied to them just for two hours twice a week. Although the water supply is adequate in the town proper, it is still very hard to spare enough for growing fruit and vegetables around the town.

Like many other coastal cities Shevchenko has a beacon mounted on the roof of a tall building. But the whole town is itself a beacon showing the right path to those whose mission it is to transform nature.

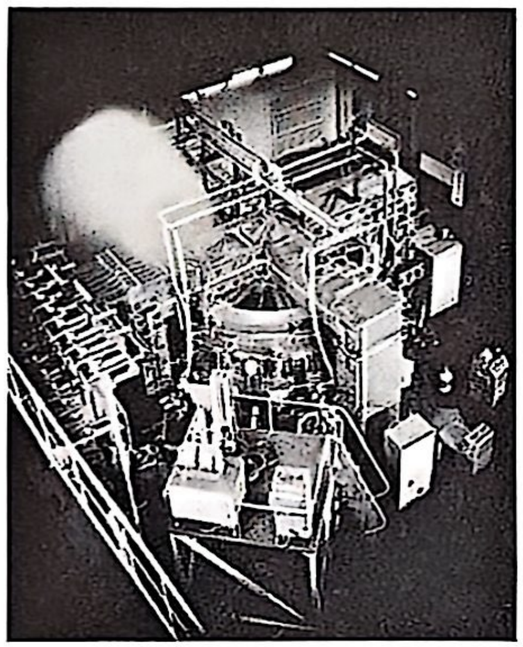


In a garden

SCIENCE

Problems, Quests, Solutions

There are 1,300,000 Soviet scientists, or one-quarter of all the scientists in the world. Research is conducted in virtually all the known fields of science and technology by more than 5,300 scientific institutions. Literally every day we hear news of successful experiments conducted by Soviet scientists, of new problems encountered and new solutions found, and new scientific and technical innovations and discoveries ensuring progress in all spheres of endeavour.



"Tokamak-10"

Assault on the thermonuclear fortress. It is a widely held opinion among physicists that the danger of a power shortage can be averted forever only by controlled thermonuclear synthesis. The Soviet Union has an undoubted lead in a number of directions of the investigation of this problem and readily shares its findings within the framework of existing international co-operation agreements. Following successful experiments by Soviet physicists, installations of the *Tokamak* type enjoy special popularity among those grappling with the problem. Experiments conducted on the biggest of these installations, *Tokamak-10*, at the Kurchatov Atomic Energy Institute, confirmed the correctness of theoretical forecasts, giving rise to the hope that more powerful installations of this type would achieve a full-scale thermonuclear reaction during which plasma would not slip from under control.

Soviet scientists at present are working on *Tokamak-20*, in which the quantity of energy released by the reaction is to roughly equal that fed into plasma. It is to become the prototype of the reactors of the future thermonuclear power stations.

Parallel with this, other ways of harnessing the thermonuclear reaction are being studied in the USSR. Impressive successes have been achieved in the "pulse" reactors, in which the reaction is initiated by laser-generated beams of light or heavy-current beams of electrons accelerated to speeds approximating that of light. At the same institute a large installation using electron beams, *Angara-5*, has been built. Specialists hope it will produce a positive yield of energy from the thermonuclear reaction.

Search for reserves of longevity. To reveal the mechanisms of ageing and find effective methods of increasing life expectancy is the task of the comprehensive prolongation of life state programme drawn up by Soviet scientists. Insofar as the mechanisms of ageing operate at different (molecular, cellular and systemic) levels of the functioning of the body, the study

Science	1965	1970	1978	1979
Scientific workers (millions)	0.7	0.9	1.3	1.3
Expenditure on science (thousand million roubles)	6.9	11.7	19.3	20.2

of the problem by specialists in different fields will help establish the different aspects of the nature of ageing and, hopefully, find ways of influencing the pace of the body's "biological clock". The aim is not merely to prolong life expectancy, but to achieve active long life for man.

Can the weather be controlled? This question is increasingly attracting the attention of scientists. In many parts of the USSR the microclimate is being improved by creating artificial rivers and water reservoirs and planting forest shelter belts. Farmland totalling about five million hectares in the Ukraine, the Caucasus and Moldavia is being protected against hail with the help of aviation and artillery. A thorough study is under way of the possible variants and consequences of stupendous projects for diverting part of the flow of northern rivers (the Pechora, Ob and Yenisei) to the arid southern regions of the country.

An attack on the atmosphere is being prepared near Lake Sevan in the mountains of Armenia. The waters of the lake irrigate the Ararat Valley. But today the lake is no longer able to supply all the local needs of water. To increase its water stock, an underground canal has been built from the Arpa river and forests have been planted on the shores of the lake to lessen water evaporation from its surface.

According to specialists, if precipitation in the lake's catchment area increases by 10-15 per cent and occurs regularly at the right time of the year, the problem will be easily solved. This cannot be achieved by the well-tried methods of firing shells with silver iodide into stratus or cumulus clouds or by using aerosol generators, because such clouds do not always form in the area.

An installation called supermeteotron will generate clouds and make them yield the moisture they contain. Now being built at an altitude of 2,300 metres, this thermal machine, consisting of six turbojet engines, will produce powerful updraughts of hot air. In the reheating tower, where the jets will merge into a single flow, the air will be heated to 1,100° C and its flow accelerated to supersonic speed, enabling it to rise to an altitude of approximately three kilometres. Losing heat, it will form clouds and rainfall over the Sevan.

Anti-hail artillery

Science as a Productive Force

Under socialism science is, to all intents and purposes, a branch of the national economy similar to its other branches. It employs about four million people—roughly as many as are employed on the railways and in com-

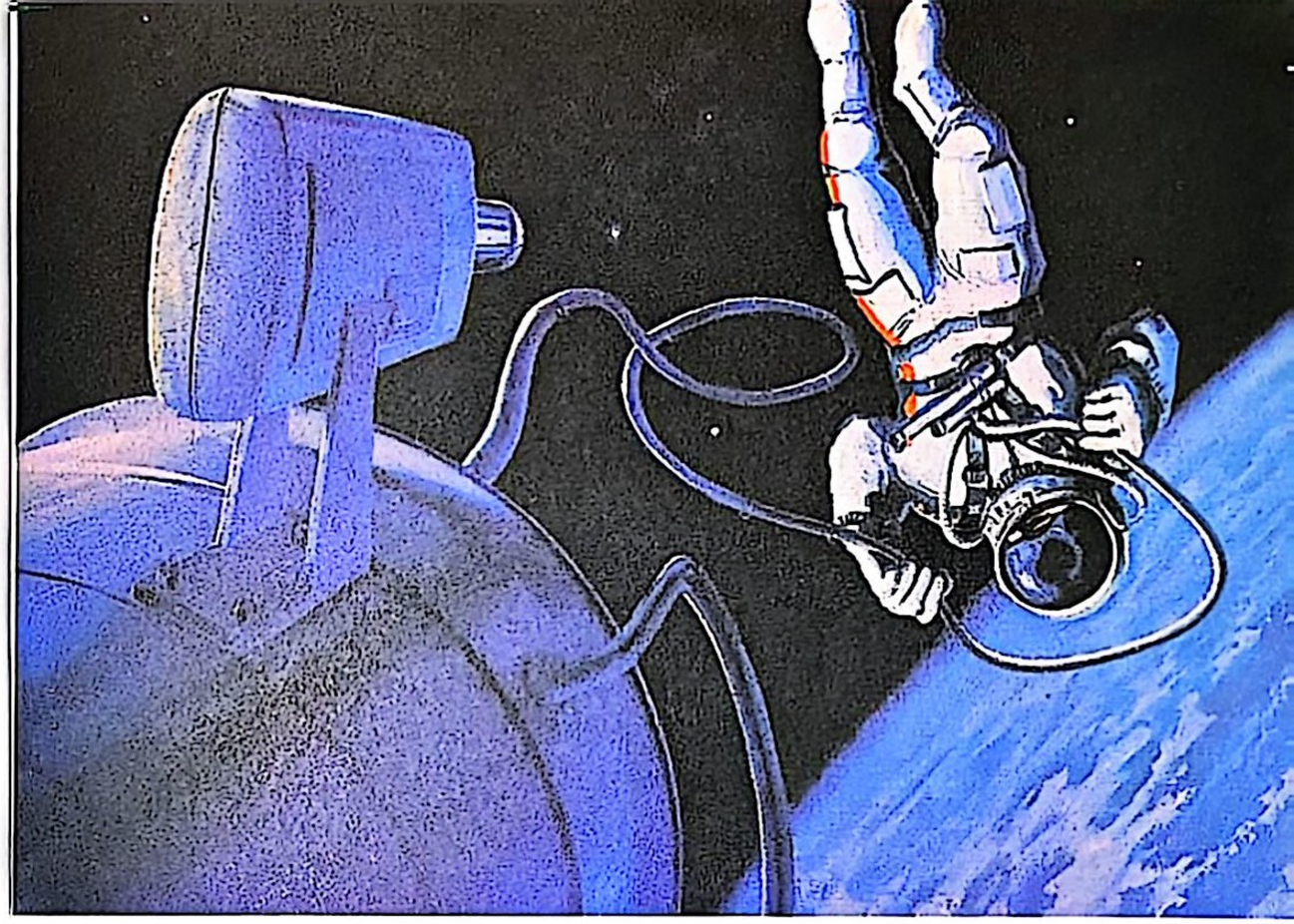
munications taken together. The network of scientific establishments has its organisational divisions each specialising in a particular field, but all of them are interconnected by a uniform state approach, by a single scientific and technical policy, by a community of aims.

The USSR Academy of Sciences, the main centre of fundamental research, co-ordinates work in the main directions of the development of science. A very important role has come to be played today by the teams of scientific workers brought together in the national Academies of Sciences of constituent Union Republics of the USSR. Wide recognition has been won by Ukrainian specialists in welding and cybernetics, by Armenian astrophysicists, by Georgian scientists specialising in mechanics, by Turkmen specialists in the reclamation of deserts, and so on. The work of hundreds of research institutions and laboratories in their respective spheres is co-ordinated by the USSR Academies of Agricultural, Medical and Pedagogical Sciences. Over one-third of the country's scientists are engaged in the field of higher education. And, finally, the largest single contingent accounting for more than half of all scientific workers, is concentrated in the research and development, and technological organisations of particular branches of the economy.

Until comparatively recently scientists working in the Academies of Sciences and the higher education network were engaged primarily in theoretical research the results of which were passed to the appropriate sectoral organisations, where fundamental ideas acquired flesh and blood, turning into blueprints, experimental machines and new production processes. Today the very course of the scientific and technological revolution, the requirements of the national economy and the intensification of the latter have compelled a revision of these traditional forms and a drastic shortening of the path traversed by an idea from conception to practical application.

An ever increasing role is being played today by regional scientific centres—complexes of scientific establishments under central management where work on the problems of the development of the region is conducted in addition to the research carried out by specialised institutes. The Siberian Branch of the USSR Academy of Sciences has departments in Irkutsk, Krasnoyarsk and Tomsk. New branches of the USSR Academy of Sciences have been set up in the Urals and the Soviet Far East. Research centres of the higher education network have begun to be organised. The first such centre has been established in the North Caucasus. They make it possible to solve both fundamental and applied problems comprehensively by the combined efforts of individual scientists and of whole teams specialising in different fields. To accelerate the application of the results of research, these centres form networks of research and development, and experimental production organisations for particular branches of the economy. Powerful experimental bases and, when necessary, whole plants are ettached to institutes dealing with branches of the economy.

The organisation of research and production associations has led to the development of the industrial sector of science. While plants are attached to institutes dealing with branch science, in the case of production industries institutes together with design offices, laboratories and experimental production units are attached to plants. Many research and production associations of this kind have become the scientific and technical centres of their respective branches turning out both new manufacturing techniques and new products, which are, as a rule, mass produced.



Filming in space

ALEXEI LEONOV, COSMONAUT AND ARTIST

General Leonov

During his visit to France cosmonaut Alexei Leonov met Mme. Consuelo, the widow of Antoine de Saint-Exupery, the famous French aviator and writer.

After her husband's death Mme. Consuelo avoided flyers in general. She grew to hate the profession that had brought her so much grief and it was surprising that she herself had asked for an audience with one.

"I wanted to meet you, M. Leonov, because you remind me of Antoine," she said.

"Thank you, it's a pleasure to meet the widow of the great Exupery."

"You know Antoine, have you read his books?"

"Your husband's books are very popular in our country and have been published in enormous editions. 'The Little Prince' has been playing in many theatres."

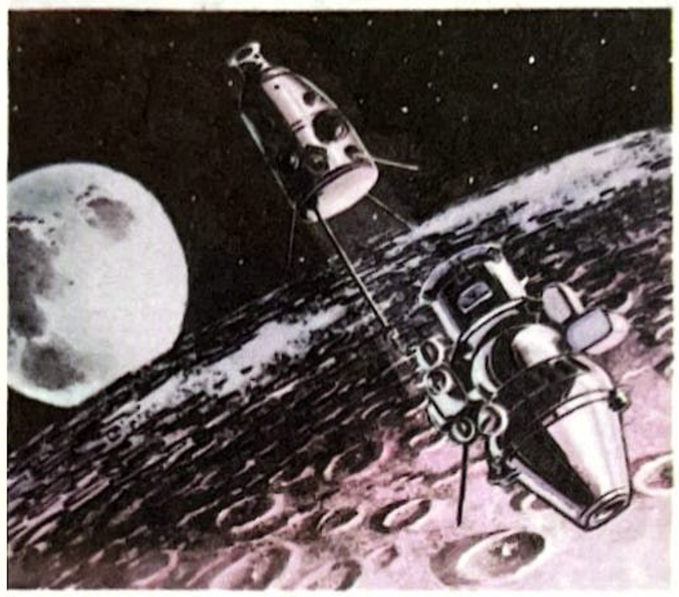
"So you know 'The Little Prince'? Yes, being an artist you certainly must. It's good when artists are flyers. But how did you become an artist?"

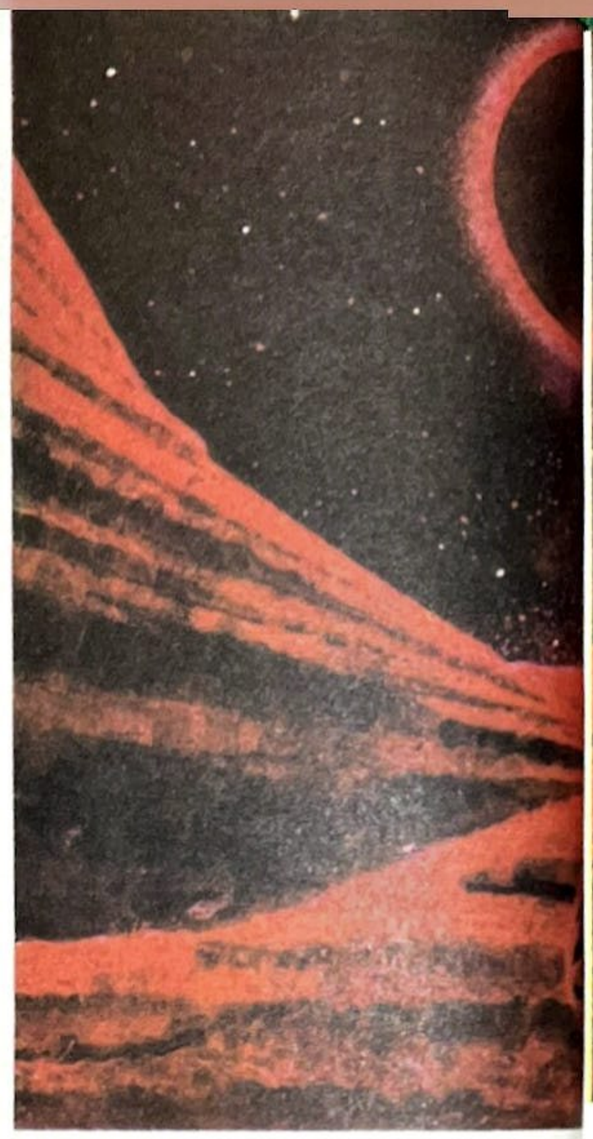
"Because of my profession."

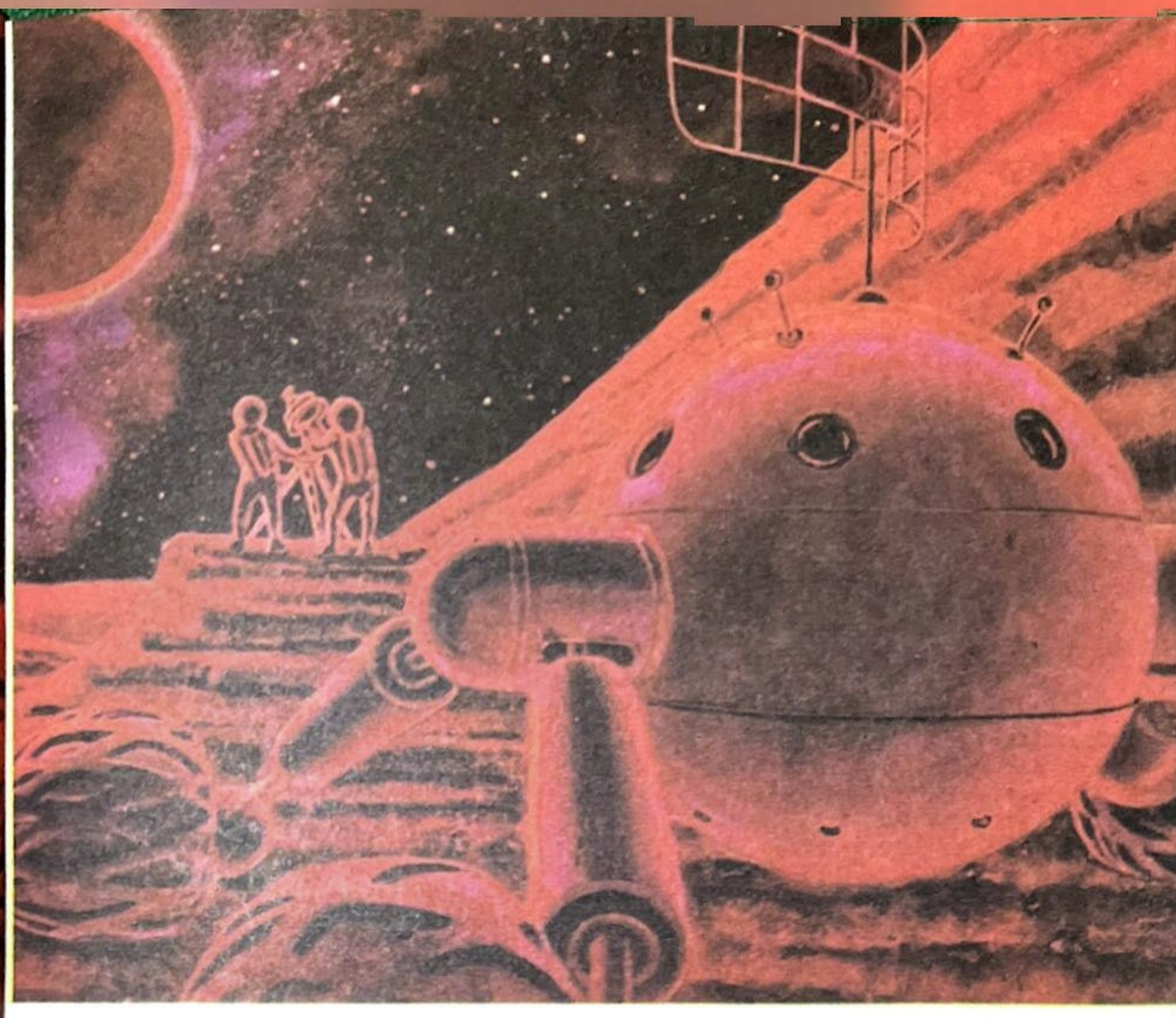
After a short pause she said:

"That's what Antoine used to say. He would say: 'I write because I'm a flyer. I get a very clear picture of what's below. I see what's good and what's bad on earth...' "

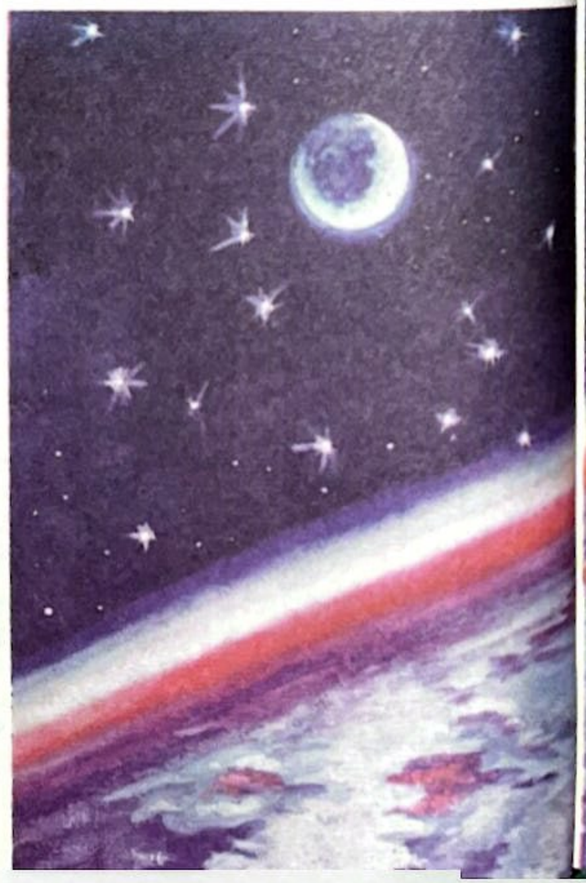
"Luna-10" goes into orbit

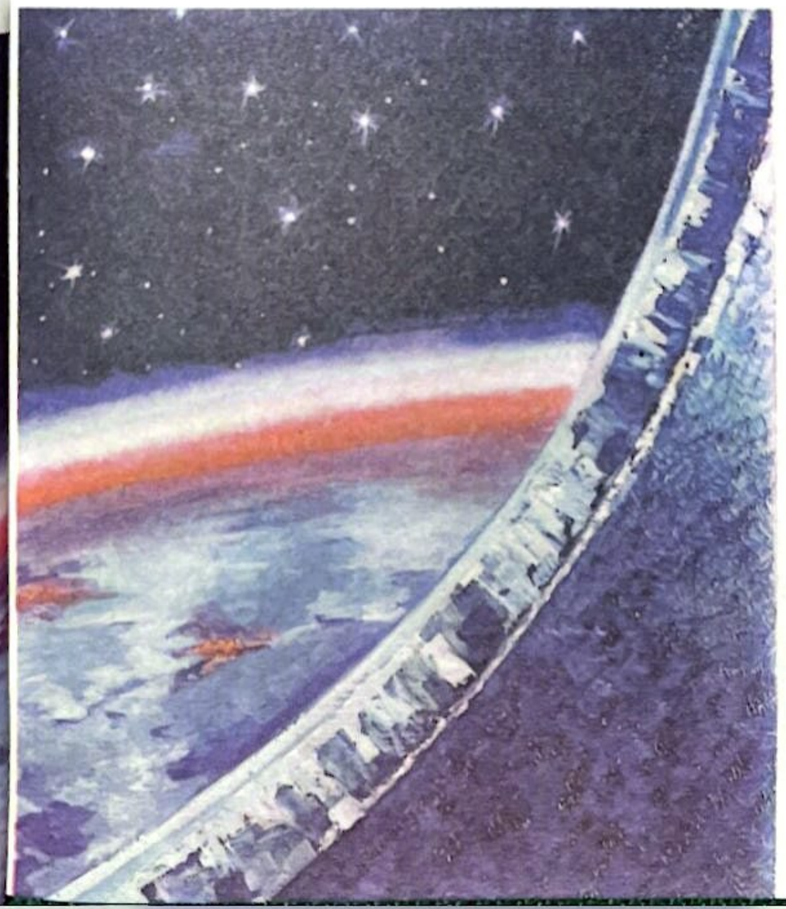






Off we go!

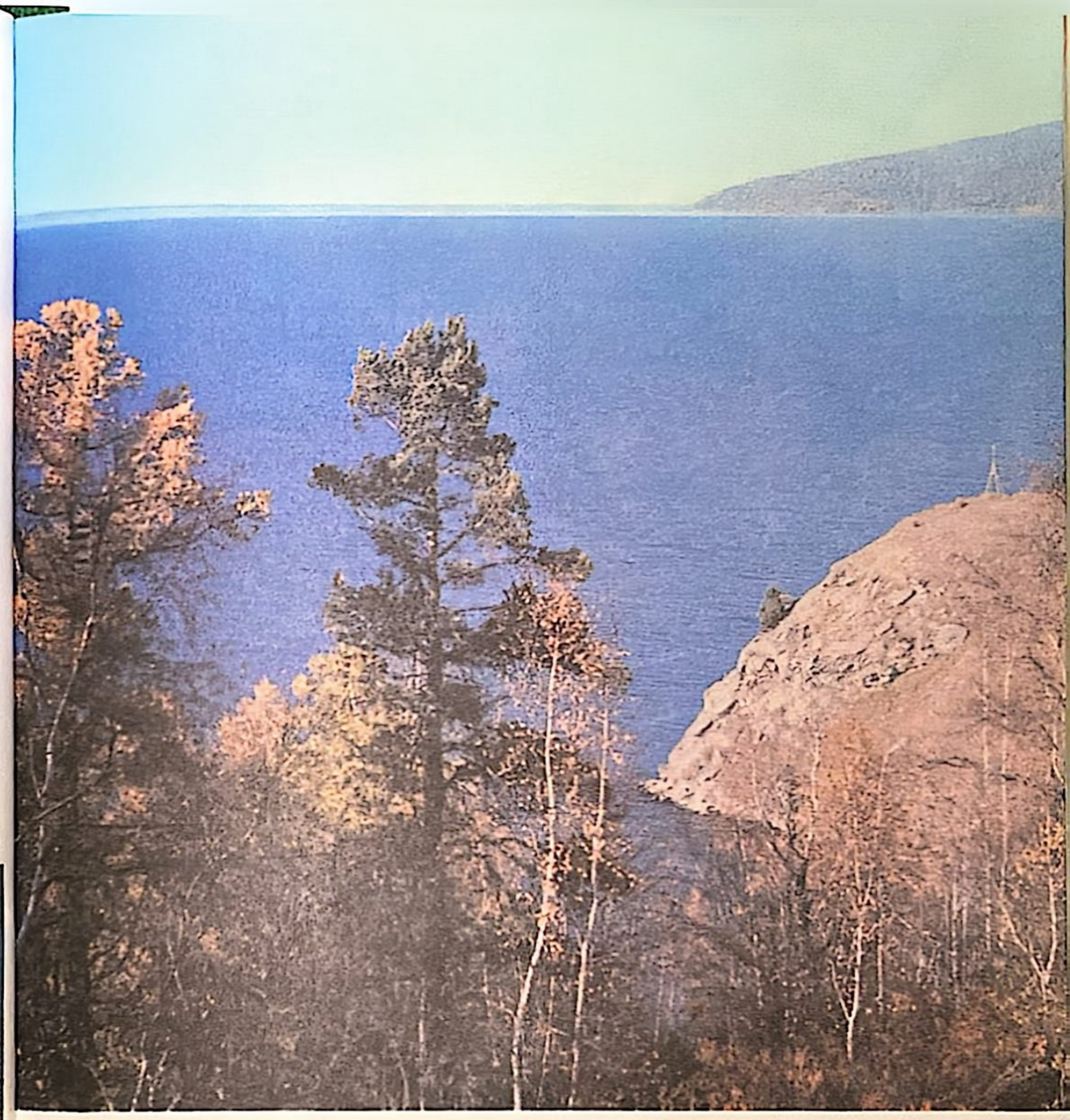




Solar eclipse seen from the Moon

Space dawn

LAKE BAIKAL'S LIVING WATER



People call Lake Baikal a "holy sea". It was from this lake in faraway Siberia that in old times merchants drew water and transported it in silver casks for the tsar's table. It was known as "living water" because of its crystal-clear purity and transparency.

For 30 million years the cold dark blue waves of Lake Baikal have been washing the edges of a great funnel in the earth's crust, one and a half kilometres deep and containing one-fifth of our planet's fresh-water reserves. Some of its fish and other animal species are unique.

Twenty years ago when construction of a large pulp and paper plant began on the shores of the lake there was an outcry of public protest and the mass media launched what became a heated debate on the fate of Lake Baikal. As a result the government obliged the plant's management to install effective purifyers. After

that members of the plant's management had to drink water straight from the settling tanks to demonstrate the harmlessness of their plant.

Sections of the Baikal-Amur Railway (BAM) which pass along the lake shores will be hidden in tunnels to protect Baikal waters from particles of dust, coal or ore that may be blown from passing freight trains.

Another hazard are tourists. More than 100,000 of them come to Lake Baikal every year from all over the Soviet Union, not to mention the 20,000 from abroad. Naturally so many visitors are bound to leave rubbish, tree stumps and even patches of burned taiga behind.

But this situation will soon change: it is planned to make the lake the centre of a national park the size of Belgium. There will be tourist bases and camping centres and the uncontrolled tourist visits will end.

RUSSIA'S MAIN CATHEDRAL

The Cathedral of the Assumption in the centre of the Moscow Kremlin is 500 years old but its five gold-plated cupolas have lost none of their lustre and it looks as majestic as ever.

The Cathedral was built by Russian craftsmen to a design by Aristotele Fioravanti, of Bologna, and was consecrated by Metropolitan Geronti. It then became the place where the most important official ceremonies were held. There Russian tsars and emperors were crowned, and in 1589 the first Russian patriarch was elected, a formal expression of the independence of the Russian Orthodox Church from that of Constantinople.

The Cathedral of the Assumption is famous for its unique collection of paintings and icons, including the 12th century St. George icon which is one of the earliest. The Apocalypsis icon is striking for its harmonious composition and soft colours. The frescos dating from 1481 are superb. There are also books, the ceremonial robes of Russian metropolitans and patriarchs, precious church plates and other religious objects, and the throne of Ivan the Terrible.

The cathedral's Trinity icon

The cathedral's interior

Metropolitan Peter's shrine

Cathedral of the Assumption

Social Security

Citizens of the USSR are guaranteed the right to maintenance in old age, in sickness, in the event of disability or loss of the breadwinner. The state social security system embodies all the provisions formulated by the International Labour Organisation, except for unemployment benefits, since there is no unemployment in the Soviet Union.

There are now 49 million pensioners. No deductions for future pensions are made from working people's earnings. Pensions and other benefits are exempt from taxes.

Retirement pensions. Men are entitled to a full retirement pension at the age of 60 after working for 25 years, and women at the age of 55 after working for 20 years.

Women who have born and raised five or more children to the age of eight are entitled to a pension at 50, after having worked for 15 years.

Many other people are entitled to pension privileges, such as larger pensions, an earlier qualifying age or shorter qualifying service record. This applies to workers in industries where working conditions are arduous or present a health hazard. Miners retire at 50, engine drivers at 55, women weavers at 50 and women radiologists and air hostesses at 45.

The size of pension amounts to 50-75 per cent of average monthly earnings, or to 100 per cent for low income persons. The lower the wages the higher the percentage used in calculating the pension. If, on reaching pension age, you feel fit and wish to go on working, you will only be encouraged in this desire.

Social insurance benefits are granted to all working people. They include temporary disabilility benefits, allowances for childbirth, paid leaves in order to care for the sick, allowances during temporary transfer to a different job due to an occupational disease or tuberculosis, and in some cases free accommodation at resorts.

At a home for the aged

People with an unbroken service record of no less than eight years are entitled to temporary disability benefits amounting to 100 per cent of their monthly wages; if their service is five to eight years, to 80 per cent and, if less than five years, to 60 per cent.

The state fully maintains special homes not only for invalids but also for aged men and women who are single and in need of daily care and

Out in the country

Academician Pontryagin was born blind

medical treatment, as well as for helpless people afflicted with serious ailments.

Pensions are paid to people who have lost their eyesight. All blind people who want to work are guaranteed employment. Their incomes are exempt from taxes. They go to special rest homes, sanatoriums and clubs and have special libraries where they can read books printed in braille. The societies for the blind have schools and production-training enterprises where the blind learn trades and receive a secondary education.

Many blind people have become teachers at colleges and specialised secondary schools, and also scientists. There is one Academician who is blind: Lev Pontryagin. He lost his eyesight when he was a child but that did not prevent him from graduating from Moscow University and doing remarkable work in mathematics. He was one of the first in the Soviet Union to win the Lobachevsky Prize, established in honour of the great Russian mathematician. He is also a Lenin Prize winner and a Hero of Socialist Labour. In 1978, on his 70th birthday, Lev Pontryagin was awarded the Order of Lenin.

It goes without saying that Lev Pontryagin's academic career is quite outstanding, but not unique. There are nearly 5,000 blind people in the Russian Federation alone who have a higher or specialised secondary education. Among them there are 147 candidates of science and 31 doctors of science.

Deaf people live and study at boarding and specialised secondary schools fully maintained by the state. They are allowed to work, if they so desire, in industries where their handicap permits them to do so without violating safety rules. They receive pensions along with their wages and salaries. There are many professional artists and sculptors among the deaf. Many are enthusiasts of choreography, the theatre and sports. In Moscow there is the Central Theatrical Studio of the Deaf and the Mime Theatre which frequently tours abroad.

On the stage of the Mime Theatre

SINGING STAR ALLA PUGACHEVA

On the night she won the Golden Orpheus prize in song contest Alla Pugacheva caused a sensation. She appeared in the limelight in a flowing black gown that contrasted beautifully with the flaming red of her hair. The song she chose was the now famous and emotionally-charged *Arlecchino*. When she began singing the audience had no doubt that she was a first-class actress, not just a gifted singer. In defiance of the rules of all song festivals the audience forced Alla Pugacheva to sing an encore. Her reward was the Golden Orpheus trophy, which opened the way to stardom.

Alla Pugacheva today is almost universally idolized in the USSR. Only a few think her singing is vulgar. But in any case no one remains indifferent after hearing her. Whatever she is singing about—a clown, a king or a schoolboy—she herself is the real hero and it is about herself that she is telling us from the stage. Alla Pugacheva is an entire theatre in herself.

She has recorded 100 songs for radio and films and has made a TV film ("The Theatre of Alla Pugacheva") and a feature film ("A Woman Who Sings")—all of which have had an enormous success. Her seven records have been released in 100 million copies. Among her latest is one entitled "Rise Above Vanity", consisting of songs she herself composed, and another, "This Is Only a Beginning", dedicated to the 1980 Moscow Olympics.

Culture

Socialist culture is multinational. It is a fusion of cultural riches that has integrated the most typical features and traditions of all the Soviet national cultures without exception. Each of them draws not only on its own sources but on the common treasury of culture.

The unity and variety of cultures of the Soviet nations and their mutual influence is the fertile soil from which have sprung hundreds of writers and artists outstanding for their individual qualities and at the same time for the national traditions of their creative work. The Russian composers Sergei Prokofiev and Dmitri Shostakovich, the Ukrainian film director Alexander Dovzhenko, the Kirghiz writer Chinghiz Aitmatov, the Georgian actor Sergo Zakariadze, the Lithuanian sculptor Gediminas Jokubonis, the Uzbek dancer Tamara Khanum, along with many others, have become the pride of all Soviet people.

Many works of art are commissioned by the state (through the Ministry of Culture) and by public organisations. There is nothing unusual in this. In ancient Greece and Rome many masterpieces were made to order for emperors, consuls and military leaders. It was in fulfilment of commissions from popes and cardinals that Leonardo da Vinci, Raphael and Titian, along with other outstanding masters, created their works. Picasso painted his famous *Guernica* in fulfilment of a commission from Spain's Republican government.

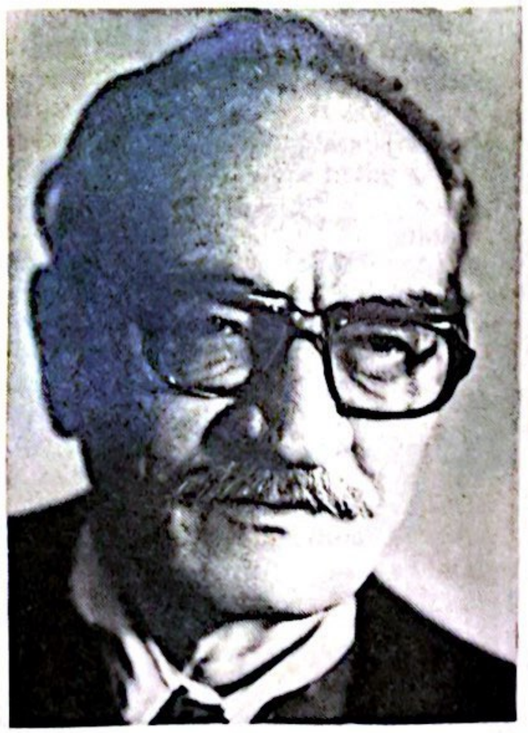
The state does not in any way encroach on the freedom of creative work. It gives the artists a sort of long-term programme from which he is free to choose any subject and offer his own interpretation.

The state does not and cannot give the writer, composer or painter any binding rules as to how they should do their work and it does not foist plots or compositions upon them. Mikhail Sholokhov's *And Quiet Flows the Don* and Dmitri Shostakovich's symphonies were not written to officially prescribed patterns.

In the final resort talent is the gauge of a work of art. Naturally talents cannot be made to order but one can lay the groundwork that ensures they will develop to the full. The system of state and public commissions offers the best opportunity for bringing out talent and displaying it to the best advantage. It promotes creative efforts.

Literature. Of late Soviet literature has been firmly linked with the names of Valentin Rasputin, Vasili Shukshin, Gavriil Troyepolsky, Chinghiz Aitmatov, Yuri Bondarev and Bulat Okudzhava.

Gavriil Troyepolsky



The writer **Gavriil Troyepolsky** will soon be 75. He lives in Voronezh in Central Russia, far from the busy capital.

The sudden interest in Troyeposlky's work can be likened to an explosion. The first blast came in 1953 with his collection of stories entitled *Notes of an Agronomist*. The second blast came 20 years later when the writer published his narrative *White Bim Black Ear* which has become a bestseller in the West.

Notes of an Agronomist was not a chance occurrence. The writer was born in the country in the family of a priest. Upon graduating from an agricultural school he became a schoolteacher instead of an agronomist but later returned to his profession and developed several new varieties of millet. The writer had a good knowledge of the life he depicted in his book. The collection is a work of satire aimed against time-servers, conservative attitudes, greed and indifference to one's work.

It is many years since Troyepolsky moved to the city, but his affection for and understanding of nature are an integral feature of his work. He is keen on hunting and fishing and is constantly drawn to the open fields, the forests with their tranquillity and fragrance and the cool rivers. His narrative *White Bim Black Ear* has appealed to readers of all ages. It was first printed in the Moscow monthly journal *Nash sovremennik* (Our Contemporary), then published in *Roman gazeta* (Novel Gazette) which has a circulation of 1,550,000 copies. Several book editions followed and finally it was filmed. It has been translated in many countries.

The story has elements that seem mutually incompatible—such as satire and lyricism, humanism, compassion and abhorrence, in this case abhorrence to heartlessness and meanness.

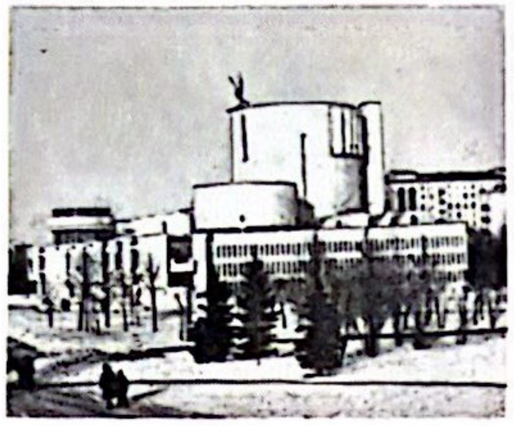
Eduard Uspensky

The plot is quite a simple one. The owner of Bim, an English Setter, is an elderly man who lives by himself. He is suddenly taken to hospital and Bim is left alone. He is brought into contact with different people whose attitude towards the animal shows their true moral worth. As the reader follows the story of the good-natured trusting dog, from his first hunting experience to the last tragic minutes of his life, he cannot help pondering ever man's unbreakable bonds with all living creatures.

Troyepolsky does not like to speak of his plans and does not give interviews. One can only hope that the reader will soon be presented with another memorable work of literature.

Eduard Uspensky has become an extremely popular children's author. He has created the winsome little animal whose name is Cheburashka. Children love him, and children not only in the Soviet Union: in Cuba they draw him on the walls of houses and in Sweden there is a children's magazine *Gena och Drutten* (Gena and Cheburashka). Eduard Uspensky's book *Crocodile Gena and His Friends* has been published in Finland and Japan, Federal Germany and

Characters at a puppet theatre in Baku



The new children's musical theatre building in Moscow

Czechoslovakia, Hungary and Italy. It will soon be translated in Britain.

In his teens Uspensky had never thought of himself as a children's writer. Yet while a student at the Moscow Aeronautical Institute he was fascinated by the amateur comedy theatre and devoted much of his time to writing scripts and verse for its performances. He believes that was the time when he was born as a writer.

It is not often that a writer's first work brings him immediate fame. Why did Cheburashka and Crocodile Gena captivate children's hearts? Here is what the author says about this.

"The success of the story apparently lies in the fact that the desire to be someone's protector is inherent in each child. And my trustful ingenuous Cheburashka seems to be looking to youngsters for help, appealing to their kind feelings: sensitivity, compassion and comradeship."

A cartoon film based on Cheburashka's adventures has been bought by many countries.

Modern Soviet literature is an amalgam of 76 national literatures. The writer **Yuvan Shestalov** comes from a small nationality called the Mansi, who live in Western Siberia. Although there are only 8,000 people who can speak the Mansi language, Yuvan Shestalov's books are read by millions for they are translated into Russian, Ukrainian, Georgian and other languages.

Theatre. There are 580 theatres in the Soviet Union and over half of them are drama theatres. They give performances in 40 languages. Like other cultural institutions they are not regarded as profit-making organisations. Significantly, even when seats for every performance are regularly sold out, many of the theatres would still not be able to function without a government subsidy.

There is a great variety of styles in the Soviet theatre. This accounts for the marked distinction between, for instance, the Moscow Art Theatre, the *Sovremennik* (Contemporary) Theatre, the Vakhtangov Theatre and the Taganka Theatre, all in Moscow, and the Drama Theatre in the town of Panevezhis in Lithuania; each of these theatres has its individual style and character.

Many Soviet plays enjoy well-deserved success abroad. A. Arbuzov's *An Old-Fashioned Comedy* has had nearly 400 performances in Paris, each time drawing a full house. US audiences show an interest in plays on war themes. Mikhail Roshchin's *Troop Train* has scored a success in Houston, Texas. A. Salynsky's *Pebbles in My Palm* has also appealed to Americans.

In 1920 a Theatre for Young Spectators, the first of its kind in the world, opened in Moscow. This professional theatre with its special appeal to children has produced theatre workers who are actor and teacher rolled into one.

There are also over a hundred puppet theatres for youngsters. Two new musical theatres have been opened—in Odessa and Shchelkovo, a city near Moscow. The Moscow musical theatre has moved to new premises with seats for 1,500 children.

The USSR has 14 higher educational institutions training theatre workers where the competition for admissions is especially great.

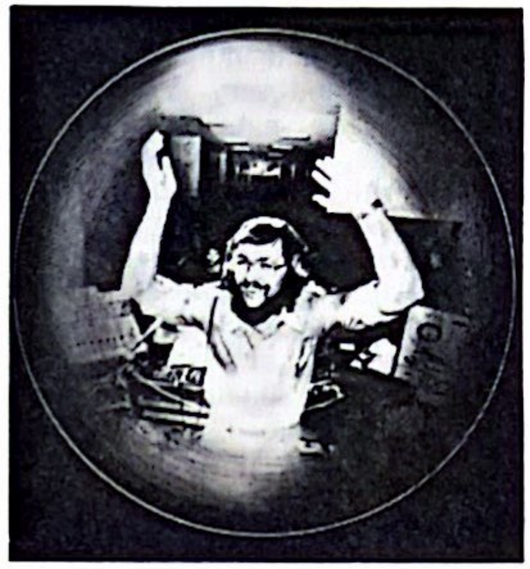
Music. In 1980 the repertoire of Soviet theatres included 150 operas by Soviet composers varying widely in subject and style—from Alexander Kholminov's *Optimistic Tragedy* on a historical theme, which has been enthusiastically received at many opera houses for more than a decade, to the poetic opera *The Sisters*, which Dmitri Kabalevsky completed a short time ago.

Opera as a genre is experiencing a revival, and it is very popular with young people. The traditional love of composers for opera is not flagging either. Some contemporary composers such as Sergei Prokofiev and Dmitri Shostakovich, Zakhari Paliashvili, a Georgian, and Alexander Spendiarov, an Armenian, are deservedly considered classical Soviet composers. The operatic genre is developing in all the republics of the Soviet Union without exception.

Light opera is also very popular. Soviet musical comedy is in many ways a new genre. Largely based on modern songs, it is profoundly optimistic and this optimism has become one of its basic features.

Young people in the Soviet Union are gravitating towards new rhythms probably as a result of changing times. This explains why new **vocal-instrumental groups** are proliferating. Posters announcing their concerts draw thousands to concert halls, stadiums and parks.

Discotheques are another form of satisfying young people's musical needs and interests. Soviet discotheques, which have been developed



Disc jockey Sergei Kamentsev

by Soviet youth, may be described as a special kind of musical clubs to which people come not only to dance and chat with friends over a cup of coffee but also to discuss the latest news in the world of music.

The programmes there are presented by disc jockeys, enthusiasts who do the work for the love of it. There are three grades of them and grading is done by a special commission of composers, musicians and music critics.

For many years now **amateur songwriters** have been successfully vying with professional composers. New songs usually spring up in the hub of big cities reflecting interests and problems of town people, and then the songs travel across the country. They are sung everywhere, where friends meet over a glass of wine, at camping sites, at students' summer work sites, and the author of the songs often remains unknown.

Today amateur songs are enjoying peak popularity. What are they about? About everyday city life, Moscow, love and the last war. The subjects are not new. They have often been treated by composers and poets. But, strange as it may seem, it is these amateur songs performed to simple guitar accompaniment that have sud-

denly become so popular. The reason apparently lies in their optimism, their non-routine and very flexible composition, their natural intonation devoid of ostentatiousness even when dealing with serious subjects, and their unsophisticated accompaniment. Every listener—and this is particularly true of young people—feels that the song is about him and for him and that he can easily sing and play it himself.

The number of amateur songwriters is rapidly growing.

The songs of Alexander Gorodnitsky, a geologist and poet, have made a great contribution to this genre. They reflect his love for his homeland, his love of life, while preserving the intimate and romantic intonations that are so valuable in songs of this kind. One of his songs (*After the White Metal*) has become a peculiar hymn to geologists, another (*Shoals All Along the Way*) is sung by students's building teams and yet another (*Leather Jackets*) is now the favourite song of Polar flyers.

Amateur song festivals and contests are very popular, attracting audiences of up to 20,000. They are usually held in the open air. Tents are pitched, bonfires are kindled and both performers and listeners enjoy concert that go on for several days.

Rodion Shchedrin

The **composer Rodion Shchedrin** has been attracting particular attention in the musical world. His work does not aim to suit all tastes. It is often controversial and always interesting for posing acute problems, for its boldness and unexpectedness. Rodion Shchedrin's music is effective and original and is convincing in its fresh approach to Russian folk melodies. Having at first earned the reputation of a sprightly talent he suddenly developed into a sophisticated musical philosopher.

From his early works ringing with merry Russian *chastushkas* (rhymed couplets on a humorous theme), he went on to emotionally coloured music expressed in the bitter merriment of the old Russian song *The Snows Are Not White* and then to tragedy in his opera *Dead Souls*, based on Nikolai Gogol's novel about the hard fate of the Russian people; on this opera the composer worked for ten years.

The same evolution from simple forms to complex compositions, from sheer feeling to feeling ruled by thought, is to be observed in Rodion Shchedrin's ballet music. The composer's ballets have been inspired to a large extent by his wife and friend, the great Soviet ballerina and actress Maya Plisetskaya. His first ballet written 20 years ago was *The Little Humpbacked Horse* based on the sage Russian fairy tale. Then came *Carmen Suite*, an original arrangement of music from the opera by Bizet, and the ballet *Anna Karenina*, based on Tolstoy's novel. Rodion Shchedrin's and Maya Plisetskaya's latest work is the *Seagull*, a ballet based on Chekhov's famous play.

Cinema. The film *Battleship Potemkin* made by Sergei Eisenstein in 1925 is to this day considered by many critics to be the best film of all times and all nations. The secret of its immortality lies in its organic fusion of the truth of life with a supremely artistic handling of the theme of revolution.

Every year the Soviet Union's 39 film studios release 150 feature films, 100 TV films and over 1,400 shorts, documentaries, cartoon and popular science films. Daily attendances at cinemas all over the country total 11-12 million.

At the recent 12th National Film Festival the two main prizes went to *Centaurs* (Mosfilm studios) and *A Few Interviews on Personal Problems* (Georgia film). The first is a striking example of the kind of political film which has lately become quite popular, especially in France and Italy. It analyses the events preceding the tragedy that took place after a fascist putsch in a Latin American country; the characters' outward appearance, their names and the setting bear a close resemblance to Chile. The second film deals with purely local human problems; it is a psychological drama about a woman journalist who spares no effort to solve other people's problems but unfortunately fails to set things right in her own family.

Historical films are very popular in the Soviet Union. A special prize for films on historical subjects was awarded to the two-part film *Yemelyan Pugachev* about the legendary leader of the peasant uprising in 18th-century Russia. Among screen versions of classical literature *Father Sergius*, based on Tolstoy's story, deserves special mention.

Many adventure and entertainment films were also shown at the festival. The prize for the best comedy went to young director Vladimir Grammatikov for *A Dog Sauntered Along the Grand Piano*, an exquisite musical comedy about the life and dreams of a simple village girl.

The view that the cinema is an art which embraces the broadest masses and cannot exist without a response from the audience retains all its significance in Soviet films. It is not an easy task to make films that avoid two extremes: either catering to purely commercial tastes or satisfying only the needs of elite intellectual circles. Yet it is a task that a genuine artist cannot avoid.

The most noteworthy films appraised at the recent festival showed that without abandoning its artistic or ideological criteria the Soviet cinema can produce films that are understood and appreciated by the broadest audiences. In this respect one may speak of the very dramatic plot of *Centaurs*, the splendid camerawork of *Father Sergius*, the superbly directed mass scenes in *Yemelyan Pugachev*, Alexander Gradsky's magnificent rock music to the adventure film *Let's Have a Chat, My Lad . . .*

The festival showed that Soviet cinema, which will soon mark its seventieth birthday, faces many problems. It is still slow to depict vital problems of our time. There are far too few films about country life although over a third of the Soviet Union's population are country dwellers. Films for children often turn out to be films about children.

According to the world press the 20-serial epic *The Unknown War*, produced by Soviet and US documentarists, was the greatest hit of the year. Dedicated to the Soviet Union's Great Patriotic War against nazi Germany, the film was received with great interest in the US, USSR and other countries. It was awarded the Grand Prix at the International Festival of TV and full-length films held in New York and the Grand Prix for documentaries at the Miami film festival.

Several feature films have been produced jointly with studios in other countries — among them Bulgaria

Soviet cameraman Roman Carmen and American actor Burt Lancaster at work on the serial "The Unknown War"

(*Blue Light Men*), Switzerland (*Autumn Season*), Italy (*Life Is Wonderful* and *The Story of the Five Rings*), Turkey (*Legend of Love*) and Finland (*After Matches*).

Circus. The circus enjoys countrywide popularity and every performance usually brings a full house.

Circus directors stage big performances which incorporate many theatre, cinema and variety show features. The Soviet circus features artists of various republics who perform traditional numbers. Widely represented are Ossetian horsemen, Uzbek and Tuva tightrope-walkers and Russian trapeze artistes.

Famous clown Yuri Nikulin (right)

Family traditions are especially strong in the circus. Widely known are the Durov animal trainers and the Kio illusionists.

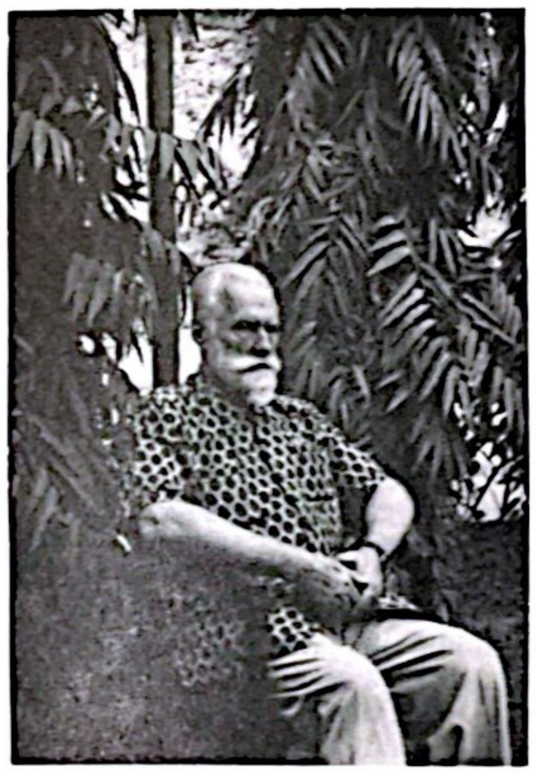
The stars of Soviet circus, the clowns Oleg Popov and Yuri Nikulin, always draw huge audiences. While employing the most diverse methods of their art, resorting to the grotesque and to buffoonery in their most extreme forms, they have substituted specific themes for former abstractions. The result is that instead of laughing at the artistes the audience laughs with them at the shortcomings they ridicule.

Illusionist Yuri Avyerino flabbergasts audiences by "growing" a lifelike fruit orchard before their eyes and then turning it into a "field of ripe wheat".

Painting. The Soviet realistic school of painting emerged in the 1920s. The main features of painting in this country are its wealth of ideas, the general significance of its imagery and its powerful affirmation of life. A portrait is primarily an expression of creative aspiration, a landscape is expected to capture the natural scenery as transformed by man's work and with a touch of romance and lyricism, and scenes of daily life should portray the beauty of a regular working life. The theme of history and the socialist revolution is given particularly great social emphasis in Soviet art.

A Lenin prize was awarded to Sergei Gerasimov for his landscapes in the *Land of Russia* series, to Arkadi Plastov for his portraits of collective farmers, to Yuri Pimenov for his pictures *New Neighbourhoods* and to Yevsei Moiseyenko for his *The Years of War* cycle. Svetoslav Roerich, a Russian-born artist presently living in India, was made an honorary member of the Academy of Arts of the USSR.

Sculpture. Soviet sculptors have devoted much of their work to the heroism of Soviet people during the Great Patriotic War and to the



Svyatoslav Roerich on his 75th birthday and his triptych-I "Liberation"

memory of the victims of nazism. The best of these works have been awarded Lenin prizes: the monumental ensemble *To the Heroes of the Battle of Stalingrad* at Volgograd by Yevgeny Vuchetich, the memorial ensemble *To the Memory of the Victims of Fascist Terror* in the Latvian town of Salaspils by sculptor Gunar Asaris and the *Khatyn* memorial in Byelorussia by Yuri Gradov.

Soviet monumental art has transcended the confines of the USSR. There are many monuments, stained-glass pieces and paintings produced by Soviet artists in the German Democratic Republic, France; the Lebanon, Switzerland, Sri Lanka and other countries.

Folk arts and crafts are very popular in the USSR. Altogether more than 200 traditional folk crafts are still practiced in various parts of the Soviet Union. The best known of these are lace making, woodcarving, carving in stone and bone, leather tooling, the painting of miniatures on black lacquer, ceramics, wood inlay, embroidery, carpet weaving and metal chasing.

A worldwide reputation is enjoyed by many folk crafts, such as the artistically painted lacquerwork boxes from the villages of Palekh and Fedoskino, Khokhloma paintings, Dymkovo toys, Vologda lace, chased silver from the North Caucasus, "kumanets" jugs from the Ukraine and carpets from Turkmenia.

Art schools are a new development in the system of public education. So far there are very few such schools. In Moscow, for example, only three schools are functioning. In these schools boys and girls are taught the fundamentals of music, the arts, choreography and aesthetics, in addition to receiving a general secondary education.

The curriculum of these schools begins with a preparatory programme for six-year-old children. Not all of them can read or write, and they are

not expected to. In the preparatory class they are taught listening to music, singing, eurhythmics, drawing and modelling in clay. This is what is called the pre-instrumental period of learning and it lasts from one to two years. Its aim is to foster a love for the arts in children and to determine the extent and bent of each child's talent.

At first the teachers avoid giving their pupils any kind of exercises to do. In piano classes, for example, they begin with songs which will catch the children's fancy. They also teach the children how to coordinate music and motion and try in every way to stir their artistic imagination.

When their abilities and bents have become sufficiently clear, the children are divided into groups according to specialisation.

The programmes include playing musical instruments, conducting, drawing, clay modelling, easel painting, sculpture, eurhythmics and dancing.

On completing the course at the school the children can sight-read music fluently, play musical compositions and accompaniment. They know the history and origin of their chosen musical instrument and have a good idea of world art and the classic works of music, painting and choreography. Whether they will one day become professional artists still remains to be seen at this stage. Those who do feel art to be their vocation can enrol at any of the 73 conservatoires and art colleges in the Soviet Union.

Amateur cultural societies are a form of mass non-professional art activities. There are more than 25 million amateur musicians, actors and singers organised in amateur groups and clubs and ten million of these are children.

Amateur **jazz ensembles** are organised at Houses of Culture and clubs which provide them with instruments and all their equipment, as well as premises for rehearsals, and also finance their costumes and concert tours.

The first postwar jazz ensembles that emerged in the mid-fifties were purely amateur. They made up the jazz group that took part in the 1962 Jazz Jamboree in Warsaw. Trumpeter Andrei Tovmosyan had only just left school, saxophonist Alexei Kozlov was an architect and designer, pianist Vadim Sakun and drummer Valeri Bulanov were physicists while guitarist Nikolai Gromin was an engineering economist. The ensemble based itself on American pop music and at the same time wrote its own compositions.

The chief problem of engineer-pianists and budding scientists with a flair for the saxophone was where to find time and energy for their professional work as well as for music. Many of them continued to treat music as their hobby. Guitar player Nikolai Gromin has defended his Candidate of Science thesis on economic statistics. Tenor saxophonist Alexei Zubov, after graduating from the Physics

Circulation of central daily newspapers (in million copies)

Pravda	10.7
Trud	10.5
Komsomolskaya Pravda	10.1
Pionerskaya Pravda	8.9
Selskaya Zhizn	8.5

Department of Moscow University with flying colours, joined the professional jazz orchestra of Oleg Lundstrem.

Most representatives of that generation of amateur musicians have long turned professional and are now members of well-known variety and jazz orchestras.

The press. Every year 8,000 newspapers and 5,000 magazines are published in the Soviet Union and 85,000 book titles are issued. A feature of Soviet publishing are its very large editions. A four-volume edition of works by Ernest Hemingway, for example, has been printed in 100,000 copies, a seven-volume edition of Stefan Zweig in 385,000 copies, an eight-volume edition of the collected works of Mikhail Sholokhov in 575,000 copies. The 200-volume *World Literature Library* series (in editions of 300,000 copies) embraces 25,800 works by 3,235 authors from 80 countries. Up to a million copies of the first two volumes of the *Library of Classics* have been produced. This new series is expected to run to 150 volumes.

All 229 publishing houses in the USSR belong to the state or to public organisations. Large publishing houses specialise in books on science, the arts and other subjects: they include *Nauka* (Science), *Nedra* (Minerals), *Vysshaya Shkola* (Higher School), *Iskusstvo* (the Arts), *Statistika* (Statistics) and many more. Eleven publishing houses bring out books exclusively for children. All the peoples in the USSR, including such small nations as the Nentsi (29,000) and the Chukchi (14,000), have school textbooks and literature published in their own languages.

Yet there is a constant shortage of books. Although over 600 books are printed every year per 100 of the population, it is becoming increasingly difficult to satisfy the Soviet people's need for books, something which the foreign press considers truly

Amateur art group from Tallinn

fantastic. Moreover, the resources of the paper industry which consumes no less than 45 million cubic metres of timber a year are far from boundless.

The point, however, is that it is highly improbable that the people's needs could be fully satisfied even if paper supplies were increased. The more books are brought out, the greater the shortage, because the higher is the cultural level of society the greater is the thirst for culture.

Publishers complain that despite the fact that 90 per cent of the population have good libraries at home they are always eager to acquire new books instead of borrowing them from public libraries. The attitude of

Lacework from Vologda

the booklover and the economics of book publishing have come into conflict.

A study of readers' demands is being carried out on a countrywide scale. Orders for books are now taken by bookshops, at enterprises and in organisations. The recommendations of the Voluntary Society of Booklovers are a great help to book publishing and trading organisations.

Increasing the publication of books and studying the demands of the book market will help to solve the problem for a country which has the largest reading public in the world.

Libraries. Two hundred million people avail themselves of the services of the 360,000 libraries which house a total of 4,500 million books and magazines. There are specialised scientific, technical, educational and other libraries.

The biggest library in the Soviet Union is the Lenin Library in Moscow with 30 million volumes, including one million foreign publications. Every day as many as 7,000 people visit its 22 reading rooms. Hall No. 1, for instance, serves academicians, doctors of science and professors. Books in many languages are available, including Swahili and Old Church Slavonic, Gypsy and Eskimo. The Library has books in a total of 247 languages, including the 91 languages spoken by Soviet peoples.

The reader checks the name of the book he wants with the file cards in the library catalogue and fills out a request slip which the librarian then encloses in a plastic capsule and dispatches to the book store by pneumatic tube. The books requested are then delivered to the reader by a trolley system, a conveyor system or an automatic lift.

Requests pour into the Lenin Library from all parts of the USSR and from other countries. The only practical way to meet them is by microfilming books. Every year more than 700,000 microfilms are dispatched abroad and many more are sent to libraries elsewhere in the USSR. If it so happens that demand for some books is very high, readers can get them in microfilm form, in the form of photostatic or xerox copies.

In the computer hall of the Lenin Library

The Lenin Library has very many unique books. Some of them were printed on parchment, on slices of cork, on dried leaves and pieces of textile, with covers made of wooden

At the Hermitage

boards or birch bast. Some of these books are the size of the date aperture of a wrist watch, while others are as large as a car parking lot. Anyone who needs or simply wishes to read such books may do so free of charge.

Museums. The Soviet state finances 1,400 museums—museums of the socialist revolution, historical and memorial museums, regional studies museums, as well as natural history and art museums.

The Central Lenin Museum in Moscow contains exhibits featuring the life and work of the great revolutionary leader. Other well-known museums are the Museum of the Revolution, the Soviet Army Museum, the Museum of the Defence of Stalingrad, the Polytechnical Museum, the Museum of Oriental Art, the Museum of Russian Architecture, the Museum of Anthropology, the Museum of Ethnology and Paleontology and literary and theatrical museums.

Memorial museums devoted to particular writers and other outstanding figures in the world of culture are very popular.

The Tretyakov Art Gallery in Moscow contains more than 55,000 pictures, drawings and sculptures by outstanding Russian artists and sculptors. After studying the impressive collection in the fifty-four halls of this museum, the visitor will have a good idea of the development of the national tradition from the art of Kiev Rus down to our time.

The Hermitage Museum in Leningrad has 2,500,000 items on display, including samples of the art of ancient Egypt, Greek and Roman statuary, medieval masterpieces and the best of modern art.

The Russian Museum in Leningrad is famous for its marvellous collection of Russian paintings and sculpture.

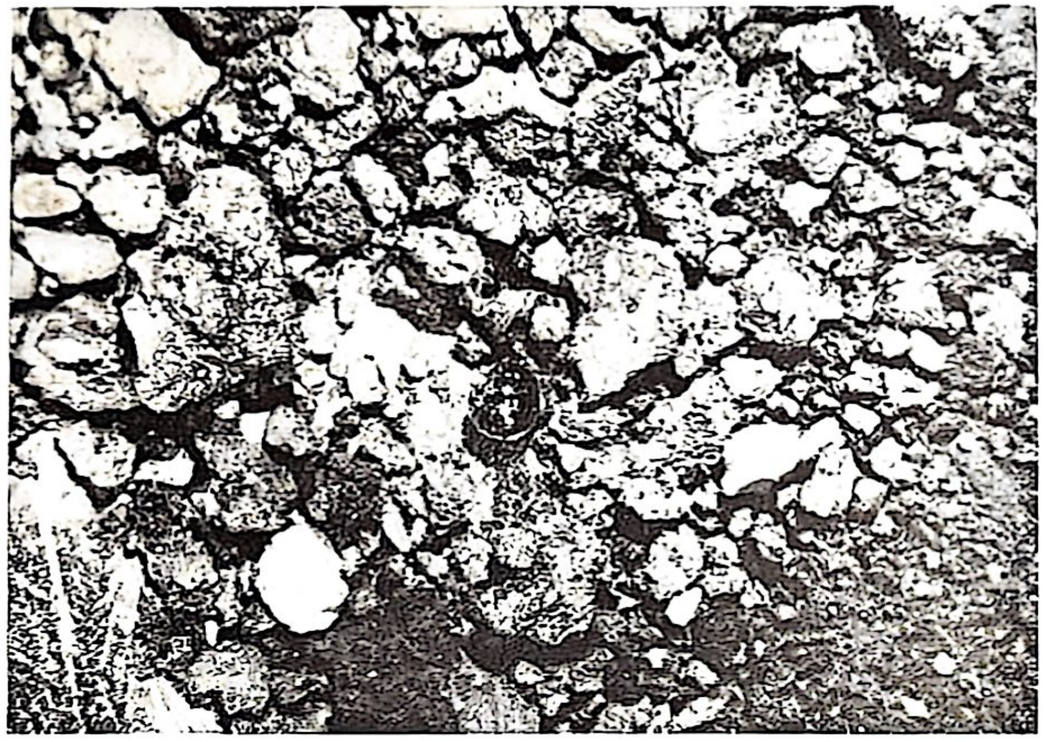
In addition to the state-run museums there are more than 8,000 school museums and museums run on a voluntary basis.

Television. Soviet TV programmes are broadcast for viewing by 80 per cent of the population of the USSR. There are 123 television centres, the biggest of which is the Moscow centre which broadcasts on eight channels, using communication space satellites. The land-based relay system embraces more than 2,000 relay stations. The Soviet Union exchanges TV programmes with dozens of countries via the *Intervision* and *Eurovision* systems.

The central television station has an educational programme to help school leavers prepare for entrance to higher educational establishments and it has programmes for school and college students. It also helps people to improve their general knowledge and professional skills. The programme is supervised by the Council of Rectors of Moscow institutes of higher education.

Television programmes for children total 100 hours a month. The most popular of these are *Good-night, Little Ones* and *Handy Hands*, a very successful programme for adolescents which has been running for many years. On Sunday morning schoolchildren can watch a half-hour show called the *Alarm Clock*. A monthly programme called *Jolly Starts* encourages competitons among children. There are also programmes in which young correspondents for the *Orlyonok* (Eaglet) studio are shown talking to famous people. Music programmes for young people are also very popular.

MOON ROCK



A hardened drop of natural origin in large-grain lunar rock

The Soviet series of *Luna* spacecraft brought samples of lunar material to Earth three times—in 1970,1972 and 1976. The material is regolith, a mixture of tiny fragments of mountain rock and minerals, including various basalts, recovered in lowland areas of the Moon known as *maria* (seas). Similar types of rock are widely distributed on Earth too but, unlike them, regolith contains no water.

It has been found that the minute particles of iron, titanium and silicon in lunar rock do not become oxidized in the Earth's atmosphere. Another interesting fact is that the information amassed during studies of the Earth, Moon, Venus and Mars suggests that the earlier stages of all the known planets were much the same. This means that our knowledge of the history of the Moon and other planets can be used to create a more authentic model of the Earth's evolution.

Recent discoveries have given rise to a widespread interest in the study of extraterrestrial material. Soviet researchers have shared their regolith samples with scientists in Czechoslovakia, the German Democratic Republic, Romania, Bulgaria, the United States, France, Britain, Austria and India.

Man in Outer Space

The dream of flying to the stars is perhaps as old as mankind itself. Ancient Indian manuscripts, Assyrian cuneiforms and Egyptian papyri tell stories of space travel with the aid of flocks of swans, hurricanes, tornadoes and other fantastic means. Such legends and myths stirred the imagination and encouraged mankind in its efforts. Mankind strove for outer space to bring nearer the far-off worlds twinkling mysteriously in the night sky.

To bring them nearer. . . But how?

108 Minutes That Shook the World

It was a sunny morning at Baikonur cosmodrome in the boundless plains of Kazakhstan. A silver rocket stood on the launching pad. The lettering on the body of the rocket spelled: *Vostok-1*. The last pre-launching check had just been completed.

A man in an orange spacesuit, whose name the whole world would know a few hours later, stepped into the lift which took him to the entrance to the spaceship. There he raised his hand to wave goodbye to those remaining on Earth. Then he disappeared into the cabin and the hatch snapped shut.

The countdown followed: "Five, four, three, two, one, liftoff!"

The rocket engines roared and clouds of smoke engulfed the base of the rocket. Supported by the tongues of flame the spacecraft hovered over the launching pad. It seemed not to have enough strength to break free of the Earth's gravity. But one second later it zoomed up to disappear in the blue sky.

That moment was destined to go down in history as the first page in the chronicle of space exploration. For the first time ever man flew into outer space. It happened on April 12, 1961, at 09.07 Moscow time.

Who was this first earth dweller to enter space? He was Yuri Gagarin. The son of a farmer, he had witnessed the hard wartime years of the nazi occupation. Then he studied at a vocational school and became a worker, college student, flying club pupil and, finally, an army pilot.

At that time outer space was an enigma. No one knew whether a pilot could keep his wits about him there and be able to think clearly and make correct decisions. Gagarin was to furnish answers to these questions. The flight director, not sure whether Yuri would be able to fly the ship by manual control if need be, asked him to solve an elementary arithmetical problem before the descent: to add two numbers together to obtain 25. The cosmonaut's clear answer reassured mission control. The spacecraft began the descent.

At 10.55 the charred metal capsule made a soft landing on a ploughed field not far from the town of Engels in the Saratov region. The ground search party quickly arrived on the scene. There were smiles, bear hugs, congratulations and, of course, the question:

"What was it like in space?"

"You can fly there," replied No. 1 cosmonaut.

An old Russian proverb says a journey begins with the first stride. The 108 minutes of Yuri Gagarin's flight became man's first step on his trek to other worlds.

To the Stars

That year there was an unprecedented number of babies named Yuri. They are now 20 years old. What are they going to do? Will some of them

In space

carry on Gagarin's work? Very likely. At present the cosmonaut's profession is attracting young people perhaps more than any other. Thousands of them send letters to the Space Training Centre with one question: "How can I become a cosmonaut?"

One of the cosmonauts, Vladimir Lyakhov, once observed that "a space flight is only the tip of the iceberg—you can see this tiny part but the submerged part which you don't see is much bigger."

When pilots were recruited for the first space team no one could tell for sure whether man could adapt himself to weightlessness, not suffer from claustrophobia and retain the capacity for work in an absolute silence which would be oppressive and disturb him. Spacemen were trained to cope with anything. The whole of the flight programme from liftoff to landing was checked on trainers. The same operations were repeated hundreds of times until spacemen could do them automatically. They spent long hours under water in what is known as a "hydro cosmos" simulating weightlessness conditions. They got used to the silence of the universe in soundproof chambers where they lived and worked for weeks not knowing what the weather was like outside or when it was day or night.

The hardest thing was to test an emergency landing in an unknown area. The mission had to be carried out in the extremely harsh conditions of sun-scorched desert or severe cold in a dense Siberian forest with the minimum of food and no outside help. You had to keep to a strict time schedule too. And there was countless spinning on a centrifuge, parachute jumps, heat and vestibular overloads. It would seem simpler to list what spacemen do not do in the course of their training than to list what they do.

The spaceman must also know a great deal about a lot of things. He has to be astrophysicist, biologist, navigator, doctor and engineer and to be able to handle about a hundred of instruments. While learning theory he must also know the equipment inside out.

Finally, the days of centrifuges, trainers, pressure chambers, scuba diving and parachute jumping are over. The spacemen face the most gruelling time of examinations. Cosmonaut Victor Gorbatko once said he had had to answer 96 questions on motion control systems. All that is part of routine training.

Each of the 49 Soviet cosmonauts led a different life before joining the space team. The oldest of them, Georgi Beregovoi, commanded a squadron of *Ilyushin-2* assault planes during the Great Patriotic War. Most of the cosmonauts, however, were born on the eve of the war. Leonid Popov was the first cosmonaut born after the war. A new, third generation had entered astronautics within 20 years of the first manned space flight.

First spaceman Yuri Gagarin with his daughters

Face to Face with the Universe

Each new flight gave a fresh answer to the question posed by Yuri Gagarin: how long can a man live and work in outer space?

Cosmonaut No. 2, Gherman Titov, spent 25 hours in orbit. At that time it seemed to be the limit of human possibilities. Yet a group flight by two spaceships piloted by Andrian Nikolayev and Pavel Popovich almost trebled the length of man's stay in Earth orbit.

The next step scientists took not without hesitation. Would a woman stand the test? Valentina Tereshkova answered the question in the affirmative by seeing Mother Earth from orbit.

Her flight was originally programmed for only 24 hours. If she felt well she was to be allowed to fly a little longer. Well, Valentina spent three days in orbit.

Shortly after her return from the space flight she married Andrian Nikolayev and a daughter, Yelena, was born.

The spaceships in the *Vostok* series were single-seaters. It was hard for a man to stay long in the cramped space of their cabins. The *Vostoks* were replaced by the multi-seat *Voskhods* with greater living space. Cosmonauts were able to work in them in their usual clothes. Besides a pilot, the crew of *Voskhod-1* included a scientist and a doctor.

The next task was to step out of the spacecraft into outer space. Fear of this void was a psychological barrier and the challenge was to surmount it.

On March 18, 1965, the *Voskhod-2* spacecraft was circling around the Earth at 28 thousand kilometres an hour and a man in a snow-white spacesuit was flying along just five metres away from it. He was cosmonaut Alexei Leonov, taking a space walk in orbit, face to face with the boundless universe. In the space of 720 seconds he covered the distance from the Black Sea to Lake Baikal.

"I'm often asked whether I was afraid to step into space for the first time," the cosmonaut said afterwards. "Well, the moment came when I had to cross the boundary between the explored and the unexplored, the line beyond which lay the unknown. . . It seems a man will never be able to leave the reliable protection of the spacecraft to work in open space calmly, without emotion. As for me, when I left the airlock chamber my pulse jumped form 90 to 170! No matter how well prepared I was for that, there was one thing that completely fascinated me: the Earth, a celestial body, lay before me, a shaggy rotating ball if

you look at it from space. That was a moment of great excitement: there it was, the whole globe, the planet of mankind."

In a Space Home

For some time the American space programme followed the Soviet programme. Later, however, their ways parted. The Americans concentrated their efforts on preparing a manned flight to the Moon. Their venture was crowned with success. On July 20, 1969, Neil Armstrong and Edwin Aldrin became the first to set foot on the Moon and pick up samples of lunar rock.

The view in the Soviet Union was that, although the lunar landing was important for prestige, the risks were not justified. The USSR confined itself to sending robots to the Moon which brought back samples of rock from various spots.

So when the space flight era was nearing its first decade man had managed to get a closer view of his celestial neighbour. The reaction of science fiction writers was remarkable: they banished any mention of the Moon from all their works.

Then came July 17, 1975, when the *Soyuz* and *Apollo* spaceships held a rendezvous in orbit. The Soviet and American astronauts were able to shake hands in flight. Then international crews of cosmonauts from the USSR and other socialist countries began to take off from Baikonur Cosmodrome.

The flights became longer and more sophisticated. A string of space laboratories in the *Salyut* series appeared in Earth orbits. Scientists believe them to be prototypes of future permanent manned space stations. The latest in the series, the *Salyut-6,* has been circling the Earth since September 1977. Its two docking units enable the station to receive two spacecraft at a time, including pilotless ferry ships bringing fresh food, newspapers, letters and spare parts.

The first cosmonauts to arrive on board the *Salyut-6* brought along a chart in which they marked off their days in orbit by filling in tiny squares. Yuri Romanenko and Georgi Grechko left behind 96 squares, Vladimir Kovalyonok and Alexander Ivanchenkov 140, and Vladimir Lyakhov and Valeri Ryumin filled in 175. But the last record was short-lived: Leonid Popov and Valeri Ryumin (on his third space flight) filled in 185 squares.

Wrestling with Weightlessness

You have to be on your toes aboard the orbital station in the true sense of the word: a moment of inattention and you have lost your pen, pencil or notebook. Things without weight fly away in all directions. Yuri Romanenko and Georgi Grechko once lost a whole container of mushrooms they had failed to fasten in time. The search took them a good hour and a half. As for Vladimir Lyakhov, he spent a week looking for his wristwatch. In despair he even began to unscrew the fastenings of his sleeping bag to see if the watch might have got behind the panel. When he looked there, he saw this note: "Silly! I've already searched the place." The note had been left by Alexander Ivanchenkov as a joke during the preceding flight. At long last the watch was found by a ventilator to which it had been sucked by an air current.

Well, these tricks played by weightlessness are quite harmless. Cosmonauts, too, get used to zero gravity quite quickly. As a rule, the feeling of discomfort passes after from five to seven days and they can easily move about with their heads down or sleep on the ceiling. The real test comes after the return to Earth.

Soviet and American spacemen preparing for a joint flight

After the 18-day flight doctors examining Andrian Nikolayev and Vitali Sevastyanov found that their hearts and muscles decreased in volume. Both spacemen could hardly keep on their feet. It became clear that weightlessness was a dangerous enemy of man and that it was much easier to get used to it than to readapt to the Earth's gravity afterwards.

"The sensation is one of recovering from a grave illness," said Georgi Grechko on the second day after landing. "You feel as if the Earth leaned all its weight on you. Even eating proves to be hard work: your stomach is unaccustomed to the weight of the food."

Life in weightlessness is unnatural for man and the inactivity of the muscles weakens the organism. The only way out is to stay in good sporting form—always. That is why a kind of stadium has been installed on board the *Salyut-6* with a running track, a stationary bicycle and an exerciser. Cosmonauts spend from 2 to 3 hours on their daily workouts.

During his second flight Vitali Sevastyanov pedalled the bicycle till he was sweating. As for Vladimir Kovalyonok, he took a fancy to the running track and wore out his running shoes.

Cosmonauts do their daily wrestling with weightlessness in special training suits which they take off only when they go to bed. The suits contain sewn-in rubber straps which load their muscles when they move, thus making up for the absence of gravity.

The longer a man stays in space the better he adapts to weightlessness. After 120 days all the erythrocytes in his blood and a considerable portion of the cells are renewed. The new red corpuscles and cells know nothing of the Earth's gravitation. How are they going to behave after the flight? A thorough examination has revealed that although the quantity of erythrocytes changes, their qualities remain the same, which is very important.

Doctors have so far not found any irreversible changes. Moreover, as a result of a carefully devised work and rest schedule for the cosmonauts, the participants in a 175-day space marathon had an easier time re-adapting to Earth conditions than the crews which had gone on shorter flights before. As for Valeri Ryumin, he was able to go on yet another space trip seven months later. Incidentally, he was the

only cosmonaut whose weight remained unchanged from takeoff to landing. It means a six-month stay in orbit is far from being the human limit. . .

Almost Complete Reliability

The first flights created the impression that spaceships were troublefree and that the spaceman's profession was completely safe. Then like a bolt from the blue disaster struck.

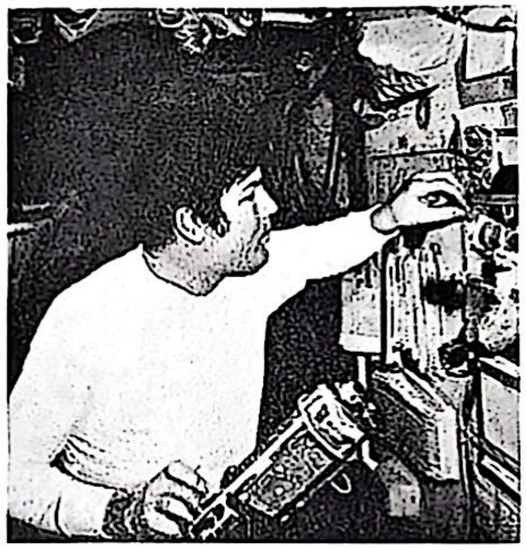
Vladimir Komarov, test pilot of the first *Soyuz* spaceship, lost his life during descent because of a faulty parachute system. A technical fault killed the crew of the first *Salyut* orbital station—Georgi Dobrovolsky, Vladislav Volkov and Victor Patsayev. Edward White was the first American astronaut to take a stroll in open space from the *Gemini-4* spaceship. On his return to the ship he had great difficulty in closing the entry hatch. That flight ended safely. But two years later White failed to open the same hatch when the capsule of an *Apollo* spaceship caught fire on the ground. Virgil Grissom and Roger Chaffee died together with him.

American spaceman Thomas Stafford and Soviet cosmonaut Alexei Leonov

Both spacecraft and orbital station are extremely sophisticated systems consisting of hundreds of parts and units. Even the most thorough check-up cannot exclude the possibility that one of the million components may fail. In manufacturing space equipment the race is to achieve as high a degree of reliability as possible. For instance, 99.99 per cent reliability has been achieved in making capacitors. It means only one in 10,000 capacitors may blow out. Well, one might say, what more do you want? The point is that this is not enough for space equipment. So reliability is being increased by one, two, three nines. When we say that 99,99999 per cent of the capacitors are reliable it means that only one in ten million may fail, so the likelihood of the cosmonaut meeting with a fatal accident is extremely remote.

Meanwhile, with every new flight spaceships become ever more sophisticated. The number of components is increasing and, as a result, reliability is diminishing. Again the designers add more nines, always with an eye to safety in outer space.

What helps a lot is the use of twin and standby parts and units. If one system breaks down, the standby circuits come into operation one after another. For instance, when Nikolai Rukavishnikov and the Bulgarian Georgi Ivanov went into orbit in a *Soyuz* spacecraft the sustainer rocket engine suddenly went out of action. But no mishap occurred because the standby engine took over to perform all the manoeuvres and the cosmonauts were able to return safely to Earth.



Valeri Ryumin repairing instruments in space

A critical stage in space flight is the launching. A precise rescue procedure has been evolved in case the carrier rocket develops a fault. The spacecraft with the crew would immediately separate from the rocket and quickly be removed to a safe distance. Parachutes would open and the capsule with the crew descend to a soft touchdown.

In orbit, however, the greatest danger to man is posed by cosmic rays linked with solar flares. Cosmonauts are warned about them by a special service monitoring and forecasting solar activity. The spaceship itself provides reliable shielding too. And when radiation hazards sharply increase the crew take medicines which prevent radiation sickness.

Another problem is protection from meteorites. Since these space wanderers travel at terrific speeds the clash of a spacecraft with a meteorite even the size of a matchbox spells almost certain death for the crew. Of course, the probability of encountering a big celestial rolling stone is extremely negligible but it does exist. The makers of the *Salyut* reinforced the station with an anti-meteorite shield. Small particles hitting the shield evaporate while bigger ones are crushed into smaller pieces which present no danger to the ship.

Of course, there will always be an element of risk in space flights. But scientists are seeking to reduce it to the minimum.

The Emotional Climate on Board

After flights lasting many days cosmonauts admitted that it was far from an easy thing to stay face to face with even the most pleasant person. But what about interplanetary trips of the future? It is estimated that a flight, say, to Mars and back will take 32 months—almost three years. Such an expedition will require not only a foolproof space vehicle but also that its crew members are psychologically compatible. If a piece of equipment breaks down it is only half the trouble—you can always replace it with another. But what if a man loses his composure.

That is why psychologists are busy selecting crews with great thoroughness, taking into account mutual likes and dislikes, trust and respect. It is vital that any crew should have a leader and the led. But first and foremost they should be kind people and good mixers who can keep cool in the direst of emergencies. Significantly, Thor Heyerdahl, an expert on the psychology of small teams, when asking the USSR Academy of Sciences to select a doctor for the papyrus boat *Ra*, said a sense of humour was one of the main requirements for any candidate.

Cosmonauts will inevitably face what is known as sensor hunger on long interplanetary flights or, to be more exact, a lack of things to see, feel and hear. For months on end they will see nothing around them but bright non-twinkling stars in a black sky and the dazzling disc of a never-setting sun. There will be neither day and

night nor summer and winter, nothing man is so used to on Earth.

So what can help him overcome the feeling of being cut off from the Earth and from his kith and kin?

It is here that technology comes in.

When Vladimir Lyakhov and Valeri Ryumin went on their flight two-way video communication with the Earth was established for the first time: a television screen lit up on board the space lab. "The pictures are as good as at home," the cosmonauts said with one voice.

As good as at home. This is more than just an assessment of the quality of the pictures. It also explains why a television set appeared on board the spacecraft. Cosmonauts had been going without one for nearly 20 years. Yet at present the television screen has become a means of keeping in touch with other people, a means of moral support for a crew confined in a close space.

In other words, the science of psychology has accumulated experience not only in crew selection but also in solving problems vital for establishing a favourable emotional climate on board a spaceship.

Everyday Life in Orbit

At first every crew views the orbital station as a comfortable and spacious home but one which is not their own. It takes time to settle down. The sooner this happens the better: for then the cosmonauts will feel happier and their capacity to work will increase.

The latter factor is of no small importance. Cosmonauts have the same working day as on Earth with breaks for lunch, rest and physical training. While in orbit they work a five-day week with two days off.

The working day schedule is quite a crowded one—there are technical, medical, biological, astrophysical and technological experiments to be done

Valeri Kubasov brings from spaceship to orbiting station new equipment sent up from the earth

and studies to be made of the Earth's natural resources and upper atmosphere. There is even more work to do when the crews receive and unload cargo ships and meet visiting crews.

The *Salyut-6* designers had to do a lot of hard thinking to make living conditions on board it as close as possible to those on Earth. Everything is important here, the colour of the walls, the lighting, humidity and temperature—incidentally, the difference in temperatures inside and outside the space lab is as much as 140 degrees Centigrade.

As for the food, it should be both tasty and highly calorific, easy to take in conditions of weightlessness, capable of being stored for a long time, weighing little and taking up little space. Before each flight cosmonauts choose the food they like best. Yet in space their tastes often change and what you liked on Earth you may come to hate in orbit. So the menu has to be varied. It usually repeats itself every six days. If you had juice, chicken pâté, coffee and candied peel for breakfast today, tomorrow you'll have cottage cheese, sausages and tea. All meat dishes are canned and bread

is in small balls so that you can put it in your mouth without having to bite it. Juice and coffee are packed in bags to which you only add hot water.

The *Salyut-6* has a shower cubicle—for the first time ever. To take a shower, you have to lower a folding plastic cabin from the ceiling. Water is pumped into a pulveriser under pressure and since the drops hover in the air without falling to the floor they are removed by a special suction pipe.

To wash, cosmonauts use paper napkins and towels impregnated with a special substance and moistened with water in advance. They also have foamless toothpaste and electric shavers with special air suction tubes.

The amenities in a space home, of course, still fall far short of our Earth standards. But it has been proved that a man can live and work in space for a long time. And that is the main thing.

Will Tulips Bloom in Space?

Man has placed part of the Earth into orbit. He took warmth, air and food along with him. But almost all of it is to be used once only. The recycling of the air and, partially, of the water does not obviate the need to replenish their stocks and replace the regenerating devices. A man needs about 700 grams of food, 800 grams of oxygen and 8 kilograms of water every day, which adds up to about 10 kilos. So how many tons will a crew need for a flight to other planets?

Since the weight of a spaceship is calculated down to the last gram, are such flights possible at all? Yes, they are. But to do so one has to build closed ecological systems in space which will use only energy.

Plants were sent into orbit. It was discovered that they could live there but only up to a point after which their growth stopped. Spacemen planted tulips on board the *Salyut-6*. Cosmonauts are particularly fond of these flowers because a sea of tulips blossoms gloriously around Baikonur Cosmodrome in the spring. But, although the bulbs produced shoots almost half a metre long, the buds never opened.

The effect of weightlessness is apparent here. Nevertheless plants can grow properly in space if they are given favourable conditions. One-third of the Earth's force of gravity is sufficient to ensure more or less normal physiological changes. For plants this force is produced in a special chamber called a "biogravistat". Leonid Popov and Valeri Ryumin carried out an experiment code-named Malachite: they grew orchids in a small hothouse on board the spaceship.

Man has not yet learned to grow flowers and plants in space to make his life and food there more pleasant and attractive. When he solves this problem he will be able to build a closed ecological system on board a space-

Returning to earth

International crew of "Soyuz-39": Soviet pilotcosmonaut Vladimir Dzhanibekov and researcher cosmonaut of the Mongolian People's Republic Zhugdermidiin Gurragcha

craft and this will allow him to go on long trips to other planets.

An Endless Road

Man felt there was too little room for him on Mother Earth. So he went out into the vast expanses of the universe. What lies in store for him along this road?

Twenty years' experience of manned space flight have yielded a great deal of data but much more has still to be learned. The space labs of today are paving the way to factories in orbit. Since building a factory here on Earth costs a pretty penny, the question is how much will it cost to build one in outer space. Will not mankind go bankrupt?

This is far from a purely academic question. Although astronautics, which is gradually losing its aura of exotic adventure, is before our very eyes becoming an important aspect of human activity, the opponents of the conquest of the universe are still very much alive and kicking.

Space exploration does cost a great deal—there is no doubt about that. Yet space technology is increasingly becoming a profitable concern. Recommendations received from orbiting satellites enable oil workers to move their rigs to new deposits, cattle breeders to drive their herds to more productive pastures and fishermen to spot greater shoals of fish at sea. In the USSR more than 400 organisations are using data obtained by space research. One of the main users is the weather forecasting service.

Clearly man's entry into outer space is far from being a fleeting passion. It follows logically from his life on Earth. It is an irreversible process which, once under way, will never cease.

Perhaps the man is already born now living who will have the honour to be the first to set foot on the sand of Martian deserts. No matter how terrible the climate of Venus may be, man is sure to get through its hot clouds to see the planet with his own eyes.

As the writer Yaroslav Golovanov has observed, "when astronomical observations are conducted outside the Earth's atmosphere, they will give us the exact addresses of the stars with planets round them and perhaps even be able to supply us with approximate data about the size of those planets and natural conditions on them. Then the great days of star travel, a heroic and tragic era will begin. It will be tragic indeed because the star travellers, in accordance with Einstein's time paradox, will travel at a speed close to the velocity of light and return to Earth in other eras when none of those who have seen them off will be here any longer to meet them, and they will find only traces of the features of their loved ones in the faces of their descendants who will greet them at unfamiliar doors. . ."

SWIMMER TOPS OLYMPIC POLL

Correspondents from the world's 22 leading news agencies named the Soviet freestyle swimmer Vladimir Salnikov top athlete of the 1980 Moscow Olympics. He first scored victory in 1,500 metre freestyle in the Olympic pool when he became the first to cover the distance in less than 15 minutes. Salnikov sliced off 4 seconds from a record set by the American Brian Goodell four years before. The next day he snatched a gold in 4x200 m freestyle relay, and on the third day he clinched victory in the 400 m event.

The son of a sailor, Vladimir Salnikov began to swim when he was six years old, and has been faithful to the pool ever since. His showing is pretty stable: no matter what kind of adversaries he has to deal with, he always comes first.

After the Games were over, the champion said: "Now I've got to recapture the 400 metre world record snatched from me by the Canadian Peter Szmidt on the eve of the Olympics."

Four months later Vladimir Salnikov set a continental record in the 400 m event in a 25 m pool at the European Cup tournament in France. Evidently, his adversaries were not strong enough to give him the impetus to break the world record.

Sport

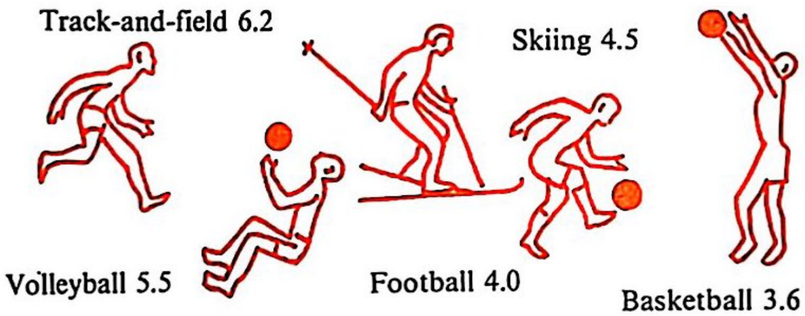
Fifty-five million Soviet people regularly engage in physical culture and sport. When all those who do compulsory PT lessons at schools and colleges are added the figure grows to 76 million.

The number of people taking part in sports activities increases especially before the finals of the USSR Games which take place every four years. They begin at the sports club level and involve millions of athletes, the best of whom earn a place in the finals.

The 7th USSR Games which ended in the summer of 1979 included the All-Union Games of Youth and Rural Sportsmen, competitions in mechanised sports sponsored by the Voluntary Society for Assisting the Army, Air Force and Navy and the 15th All-Union Schoolchildren's Games.

Characteristic of these Games are competitions for schoolchildren, for physical training is compulsory at

Most popular sports (number participating, in millions)



This mammoth cake is the prize for winners of the Golden Puck, the nationwide junior hockey championship

secondary schools. "Young Hopefuls" is the name given to popular competitions in track-and-field athletics among children. It is not a competition for the best school teams but for whole classes, i.e. all the schoolchildren. These competitions are held for the title of the best school class in the country in its age group.

Children with an aptitude for sport can enrol in one of the 6.000 junior sports schools. Competitions such as *Leather Ball* (soccer), *Silver Skates* (speedskating), *Golden Puck* (ice hockey), *Merry Dolphin* (swimming) and *White Rook* (chess) are especially popular.

Today 66 sports are practised in the USSR, not counting those peculiar to various national groups. Some of them, such as modern gymnastics and sambo wrestling, originated in the USSR and have won international recognition.

There are also many national sports. The Georgians, for instance, have their own variety of polo. The Kirghiz enjoy wrestling on horseback. The Uzbeks wrestling on the ground wear special belts for gripping. The Yakuts' favourite sport is lasso-throwing, the Buryats', archery and the Nentsi's, reindeer racing while the Russians play a game called *gorodki*, in which wooden bats are thrown at skittles arranged in combinations within a square. Championships are held in these and other national sports.

In the USSR every sportsman has a trade or profession which provides him with his livelihood. During training and competitions he continues to draw his average wage or salary. Travelling expenses during contests are paid for.

Jumping over sleds is a national sport of the Nentsi

In recent years jogging has become very popular, as well as other forms of physical exercise jokingly referred to as "running away from heart trouble". One of these is an exciting game called "orientation". It is played in a park or forest and consists of a race on foot or on skis from one reference point marked on a map to another. Participants are equipped with a map and a compass and their aim is to reach the finish as quickly as possible. In order to take part all you need is a doctor's note. Both schoolchildren and old age pensioners take part in these competitions.

Olympic medals won by Soviet sportsmen

1952- 71	1968-104
1956-114	1972-115
1960-124	1976-152
1964-121	1980-195

BEST SPORTSWOMAN OF THE YEAR

Tatyana Kazankina (number 81) is running third

In the finals of the 1,500 metre race at the Moscow Olympics on August 1,1980 the Soviet runner Tatyana Kazankina set a new Olympic record with 3 min. 56.6 sec. Two weeks later in Zurich she broke a world record to clock 3 min. 52.47 sec.

In 1977 Tatyana Kazankina, then at the peak of her sporting fame and a holder of two Olympic titles, suddenly decided to give up sport and do research at the Department of Mathematics of Leningrad University, of which she was a graduate. She also got married.

A daughter, Mashenka, was born the following year, and three months later the young mother reappeared on the track. At first she simply felt the need to move about. Then came serious training, and slowly but surely the 29-year-old sportswoman coached herself for the Olympics. Shortly before the Games she upset a world record with 3 min. 55.0 sec.

All this entranced sports commentators of such prominent newspapers as the French *L'Equipe, Československý sport,* Brazilian *O Globo* and others. Polled by the West German news agency Internationale Sportkorrespondenz they unanimously named her Sportswoman of the Year. The swimmer Barbara Krause of the German Democratic Republic took second place and Nadia Comaneci of Romania came third.

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